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# SOLID ROCKET BOOSTER STING INTERFERENCE WIND TUNNEL TEST ANALYSIS

## APPENDIX D



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Submitted To:

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
GEORGE C. MARSHALL SPACE FLIGHT CENTER  
Science and Engineering Directorate  
Under Contract NAS8-33816

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Submitted By:

**NORTHROP SERVICES, INC.**

P. O. BOX 1484 Huntsville, Alabama 35807 (205) 837-0580

**NSI**

SPACE SHUTTLE SOLID ROCKET BOOSTER  
STING INTERFERENCE WIND TUNNEL TEST  
DATA ANALYSIS  
APPENDIX D

AUGUST 1982

by

B. Conine  
W. Boyle

*Prepared for:*

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
GEORGE C. MARSHALL SPACE FLIGHT CENTER  
SCIENCE AND ENGINEERING DIRECTORATE

Under Contract NAS8-33816

*Reviewed and Approved by:*

M. H. Burroughs  
M. H. Burroughs, Manager

NORTHROP SERVICES, INC  
P.O. BOX 1484  
HUNTSVILLE, ALABAMA 35807  
(205)837-0580

## FOREWARD

Appendix D of this report presents the results of additional work performed by Northrop Services, Inc., Engineering Technology Group for the Marshall Space Flight Center under an extension to Contract NAS8-33816 and is the final report for this study. The additional work consisted of analysis of MSFC 14-inch TWT sting wind tunnel data for angle-of-attack range of 135-155 degrees, and analysis of MSFC HRWT sting interference wind tunnel data for angle-of-attack range of 120-140 degrees. Portions of the analysis were performed by Lockheed Missiles and Space Co., Huntsville Research and Development Center. The NASA Technical Monitor for this contract was Mr. D. L. Bacchus. The authors wish to acknowledge the assistance and contributions provided by Mr. Bacchus toward the successful completion of this study. The authors also wish to thank Mr. Paul Ramsey (ED32) who provided access to the data, his test log, and took time to discuss the data and results with the authors.

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## Appendix D

### INTRODUCTION

Additional analyses of wind tunnel test results from SRB sting interference test TWT 660 and HRWT 042 were conducted to evaluate the sting interference that may be present in the Space Shuttle SRB reentry aerodynamic math model. Additional wind tunnel data was obtained at higher angles of attack from test program TWT 660 and test program HRWT 042. The additional data were analyzed to evaluate the procedures used to fair the data in the development of the SRB reentry aerodynamic data Tape no. 5. Aero data Tape no. 5 was developed from TWT 660 sting interference data obtained over  $\alpha$  range A ( $\alpha = 100$  to  $120$  deg),  $\alpha$  range B ( $\alpha = 120$  to  $140$  deg) and HRWT  $\alpha$  range A ( $\alpha = 100$  to  $120$  deg).

The analyses of these data showed that in the angle of attack range near  $130$  deg, the nose mount sting had the smallest sting interference and the corrected data was close to the large model (SAllF) nose mount test results. The side mount test results had been used to develop the aerodynamic math model in this angle of attack range (SRB data Tape 2, see section II for a discussion of the wind tunnel test programs and SRB data tape test program bases). The development of SRB data Tape no. 5, which was developed by a series of "deltas" to Tape no. 2, required the development of large deltas in the angle of attack range where the test data terminated as shown in Fig. D-1. Tape no. 5 was developed by ignoring the end of the corrected data curve and fairing the curve into the SAllF nose mount data. This technique created potential errors in certain Mach number ranges because the trim angle of attack ( $C_M = 0$  with  $dC_M/d\alpha$  negative) was in the angle of attack range where the data curves had to be force smoothed. An additional problem that occurred in the development of Tape no. 5 was the development of data trends at Mach 0.5 High Reynolds number test data exited at Mach 0.4 and 0.6 from test HRWT 042. The data at Mach 0.4 showed a larger trim angle of attack than the data at Mach 0.6. Data trends at Mach

0.5 were developed by interpolating the Mach 0.4 and 0.6 data. There was concern that the data trends at Mach 0.5 may be closer to the Mach 0.4 data than the Mach 0.6 data. This was of concern since the Mach number at chute deployment was close to Mach 0.5 based on the STS-1 results.

Additions to the two wind tunnel test programs (TWT 660 and HRWT 042) were thus developed to obtain data to verify the procedures used to develop Tape no. 5. This appendix contains the results of the analyses of the additional test data along with an assessment of the errors associated with Tape no. 5.

#### Wind Tunnel Test Programs

Two additional wind tunnel test programs were conducted to develop the required sting interference data. The wind tunnel tests consisted of a transonic test, in the MSFC 14-inch Trisonic Wind Tunnel (TWT 660) and a High Reynolds number test in the MSFC High Reynolds Number Wind Tunnel (HRWT 042). Combinations of single and dummy sting arrangements were used during both tests to obtain the necessary data for the evaluation of the sting interference. A brief discussion of each test program addition is presented below.

#### TWT 660 Test Program

The TWT 660 test program addition was designed to obtain additional six-component static stability data on a model of the 146-inch diameter SRB model mounted on various sting arrangements and combinations to determine the sting effects in the angle of attack range C ( $\alpha = 135$  to  $155$  deg). The technique of developing the sting interference data is to mount the SRB model on a nose-mounted sting and obtain data with and without dummy side-mounted stings. The dummy side mounted stings are configured to simulate stings used in the MSFC 14-inch TWT test. The test program thus provided a data base that can be used to develop coefficients which may be

used to develop corrections to the side-mounted sting SRB data base. An additional portion of the test program consists of mounting the SRB model on various side-mounted stings to obtain data with and without a dummy nose sting. This procedure provided a check of the mutual sting interference, since the corrected data for both nose and side-mounted stings should agree if the total sting interference is removed from the data and no mutual sting interference exists.

The test program conducted in the MSFC 14-inch Trisonic wind tunnel provided data at Mach numbers of 0.6, 0.8, 1.05, 1.1, 1.2, and 1.46, for angles of attack from 135 to 155 deg, and roll angles of 0, 45, and 90 degrees.

The model configurations used for the test program are as follows:

<u>Configured</u>	<u>Definition</u>
MOONSC	Nose-mounted sting
MSDNSC	Nose-mounted sting with side sting
MSSOOC	Side-mounted sting
MSSNDC	Side-mounted sting with dummy nose sting

The "C" designation identifies  $\alpha$  range C. The sting interference analysis procedure was identical to the procedure used for angle of attack range A and B. The test data for the various configurations were interpolated and subtracted to obtain the sting interference due to the nose mount sting and the side mount sting. The sting interference was then removed from the basic side mount and nose mount data to develop corrected data. Tab listings of all data are presented in Tables D1 through D-125.

### HRWT 042 Test Program

The additional HRWT 042 test program consisted of the completion of the "B" angle of attack range ( $\alpha = 120$  to  $140$  deg) of the original HRWT 042 test program. The A and B portion of the test program is discussed in Section II. Selected data at Mach 0.5 was also obtained during the 042 test program addition.

### TWT 660 Data Analysis

Selected plots of the normal force and pitching moment sting interference are presented in Figs. D2 through D-11. Figs. D-2 through D-6 show that the nose mount sting has the smallest normal force sting interference in the "C" angle of attack range. This confirmed the trends from the "B" angle of attack range. The pitching moment sting interference is larger for the nose mount sting at the lower Mach numbers and smaller at the higher Mach numbers. It is noted that the pitching moment sting interference sign is dependent on the sting location. Thus the side mount pitching moment sting interference can potentially be reduced if the sting longitudinal location is properly selected.

Comparisons of selected TWT 660 data corrected for sting interference with the SRB data tape aerodynamic math model and other test data are presented in Figs. D12 through D-26. These figures present comparisons at Mach numbers from 0.9 through 1.46 and thus only include the TWT660 results since Reynolds number influence in this Mach number range are negligible.

The normal force coefficient comparisons are presented in Figs. D-12 through D-16. Fig. D-12 presents the normal force coefficient comparison with the Tape 2 values. It is noted that no change was made to the longitudinal data at Mach 0.9 in developing Tape 5 and thus the Tape 5 longitudinal data is identical to Tape 2 at Mach 0.9. Significant differences between the TWT corrected data and the tape values is noted in

Fig. D-12 to only occur near 120 deg angle of attack. The  $\alpha$  range C data ( $\alpha = 135$  to 155 deg) is noted to be very close to the tape results. The data tape results near  $\alpha = 120$  deg were not changed in the development of Tape 5 because of data trends from HRWT 039 at Mach 0.9. The additional TWT 660  $\alpha$  range C results indicate the Tape 5 results are accurate. The additional corrected TWT 660  $\alpha$  range C results presented in the other figures (D-14 through 16) indicate that a smooth curve from the  $\alpha$  range A and B results would also fit the  $\alpha$  range C results. Thus little or no error exists in the Tape 5 normal force coefficient from Mach 0.9 through 1.46.

Comparisons of the sting interference corrected pitching moment coefficient data is presented in Figs. D-17 through D-30. The corrected pitching moment coefficient data at Mach 0.9 are presented in Figs. D-17 through D-19 for roll angles of 0, 45 and 90 deg, respectively. The corrected  $\alpha$  range C data is noted to have a good trend with the  $\alpha$  range B data such that a smooth curve can be developed through the total  $\alpha$  range. The corrected data is close to the Tape 5 results although consistently on the less negative pitching moment side. Similar corrected data curves are presented in Figs. D-20 through D-26 for Mach numbers of 1.1, 1.2 and 1.46. These figures show that the  $\alpha$  range C corrected data generally matches the pitching moment coefficient humps near the upper portion of the  $\alpha$  range B data. This creates a potential error in the Tape 5 math model since the humps at the end of the  $\alpha$  range B corrected data were not incorporated into Tape 5. The humps were not used in the development of the math model because they are at the end of the corrected data and large pitching moment corrections would be required to smooth a curve from the end of the data to higher angles of attack.

Expanded portions of the data comparisons at Mach 1.1 and 1.2 are presented in Figs. D-27 through D-30. These figures show that a smooth curve through the  $\alpha$  range A and B corrected data was used to develop Tape 5. The TWT  $\alpha$  range C test results show that the humps in the curve at the end of the  $\alpha$  range B data are correct and thus errors exist in the Tape 5

math model. The error results in substantially larger trim angles in certain cases as shown in the figures.

#### HRWT 042 Test Results

The development of the sting interference and corrected high Reynolds number test results was performed using data plots due to the difficulty of interpolating the data using a computer (especially the pitching moment coefficient data). The curves used to develop the normal force sting interference and the corrected data are presented in Figs. D-31 through D-42. The figures are separated into side mount and nose mount sting configurations for roll angles of 0 and 90 deg. These figures show substantial normal force sting interference near  $\alpha = 125$  deg.

Summary corrected normal force coefficient data is presented in Figs. D-43 through D-48. Figures D-43 and D-44 show that at Mach 0.4 the corrected data is substantially different from the Tape 5 results. Figure D-45 and 46 show that the results for Mach 0.6 also show substantial differences between the corrected data and the Tape 5 results. The major error is in the 125 to 130 deg angle of attack range. The data presented in Figs. D-47 and D-48 show that the corrected TWT 660 data is near the Tape 5 values, but the corrected high Reynolds number data is generally higher. An average  $C_N$  error of approximately 0.5 exists in the angle of attack range from 120 to 135 deg.

The curves used to develop the pitching moment sting interference and the corrected data are presented in Figs. D-49 through D-60. The figures are separated into side mount and nose mount sting configurations.

The sting interference data and corrected data for Mach 0.4 are presented in Figs. D-49 through D-52. The figures show large positive pitching moments near  $\alpha = 125$  degrees similar to the normal force data. The data trends for Mach 0.6 and 0.8 show that the corrected data is

significantly better behaved with significant negative pitching moment values.

The difference between the data at Mach 0.4 and 0.6 prompted the evaluation of additional test results at Mach 0.5. Comparisons of certain data at Mach 0.4 and 0.5 are presented in Fig. D-61. It is noted that data trends for both the nose mount configuration (H00NSB) have the same data trends at both Mach numbers. Figure D-62 presents the nose mount pitching moment at four Mach numbers from 0.4 to 0.6. The curves show the similarity in data at Mach 0.4 and 0.5 and the data similarity at Mach 0.55 and Mach 0.6. Data obtained using the nose mount sting with the dummy side mount sting are presented in Figure D-63. These data were used to develop the sting interference data presented in Figure D-64. Figure D-64 shows that there is also a significant difference in the sting interference between the Mach 0.4 and 0.5 data and the 0.55 and 0.6 data. Thus the pitching moment characteristics at Mach 0.5 should be close to the Mach 0.4 results and the pitching moment characteristics at Mach 0.55 should be close to the Mach 0.6 results.

Summary corrected pitching moment curves are presented in Figure D-65 through D-75. The corrected high Reynolds number data and Tape 5 and Tape 2 results are presented for comparison. The corrected TWT660 data are presented for comparison where available. The results for Mach 0.4 are presented in Figs. D-65 and D-66. These figures show that the Tape 5 results do not predict the corrected high Reynolds number pitching moment curves near  $\alpha = 125$  deg. The data in Fig. D-65 shows the worst case where the pitching moment coefficient error is near +3.0. The Tape 5 results for Mach 0.5 are also shown for comparison. The previous discussion pointed out the similarity between the Mach 0.4 and Mach 0.5 results. Thus the error in the Tape 5 results would also exist at Mach 0.5.

The summary corrected pitching moment characteristics at Mach 0.6 are presented in Figs. D-67 through D-70. Figures D-67 and D-68 show that



errors exist in the Tape 5 pitching moment results in the angle of attack range from 120 to 130 deg. The largest error is about +1.0 near 130 deg for 90 deg roll (see Figure D-68).

Expanded summary plots are presented in Figs. D-69 and D-70. These figures show that the errors in the Tape 5 results also potentially exist out to 150 deg. Summary corrected pitching moment characteristics at Mach 0.8 are presented in Figs. D-71 through D-74. These figures show that the Tape 5 results were an improvement over the Tape 2 results but errors still exist in the predicted pitching moment characteristics. The largest error appears to be approximately +0.7 near  $\alpha = 130$  deg (see Fig. D-71). The expanded summary curves presented in Fig. D-73 and D-74 show that the errors in the Tape 5 results extend out to an angle of attack of 150 deg for zero roll angle (see Fig. D-73).

An evaluation of the Mach number trends was conducted to evaluate the trends of all the corrected data with the Tape 5 results. Example Mach number trends are presented in Figs. D-75 and D-76. These figures show that significant errors exist at Mach 0.5 and near Mach 1.05. The Mach 0.5 error exists due to the assumption that the Mach 0.5 data should be between the Mach 0.4 and 0.6 data. The present analysis found that the Mach 0.5 data should be close to the Mach 0.4 data. The figures also show that there is a large difference between the Mach 0.9 data and the Mach 1.1 data and a linear interpolation between these data sets will create errors. These errors are due to the nonlinear shape of the pitching moment curve through Mach 1.0.

## CONCLUSIONS

The analysis of additional test data from wind tunnel tests TWT 660 and HRWT 042 has identified several areas where the Tape 5 SRB Reentry Aerodynamic Math Model is in error. The error in normal force coefficient are as large as 2.0 at certain Mach numbers and altitudes. The error in pitching moment coefficient is as large as 3.0 at certain Mach numbers and altitudes.

Aero data Tape 5 should be updated to remove these errors from the math model.

In addition, data at Mach numbers of 0.55 and 1.05 should be added to the SRB data tape to reduce interpolation errors where the aerodynamic characteristics are a strong function of Mach number.

MACH 1.20 PHI 0.00 RIGHT HAND SRB REENTRY CONF.

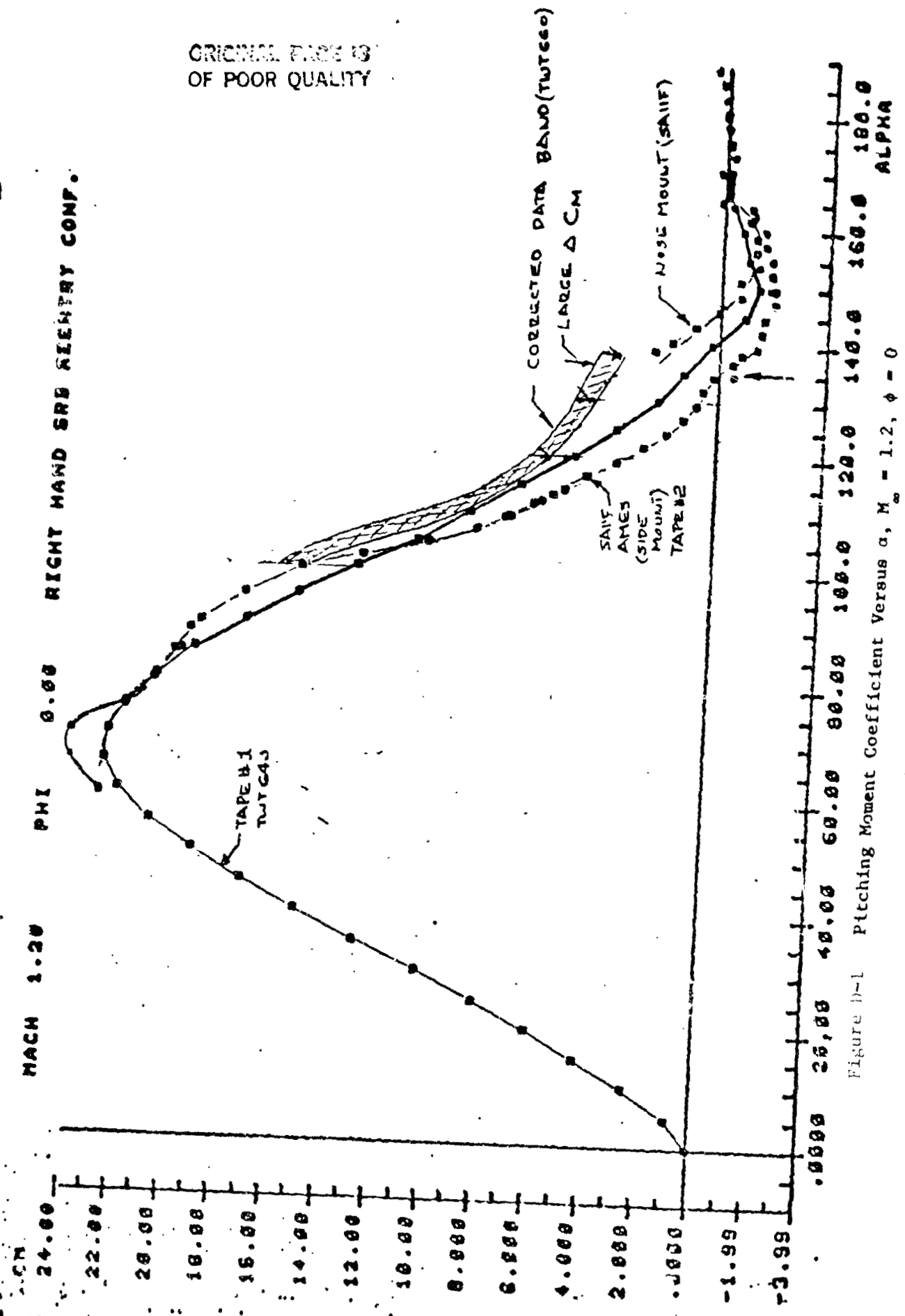


Figure D-1 Pitching Moment Coefficient Versus  $\alpha$ ,  $M_\infty = 1.2$ ,  $\phi = 0$

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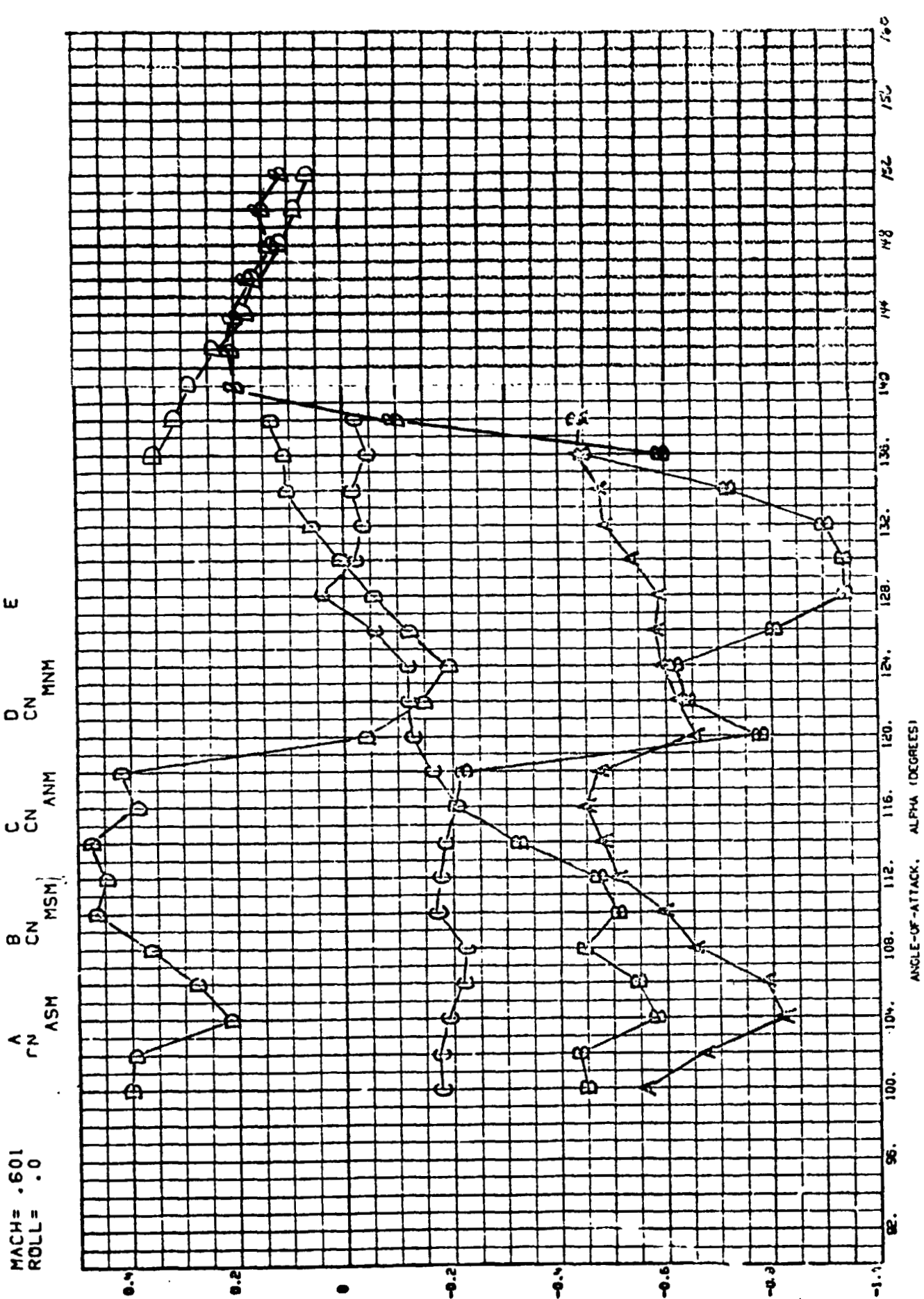


Figure D-2 Sting Interference versus Angle of Attack,  $C_N$ ,  $N_\infty = 0.6$ ,  $\phi = 0^\circ$

MACH = .601  
ROLL = 90.0

A CN ASM  
B CN MSM  
C CN ANM  
D CN MNM  
E

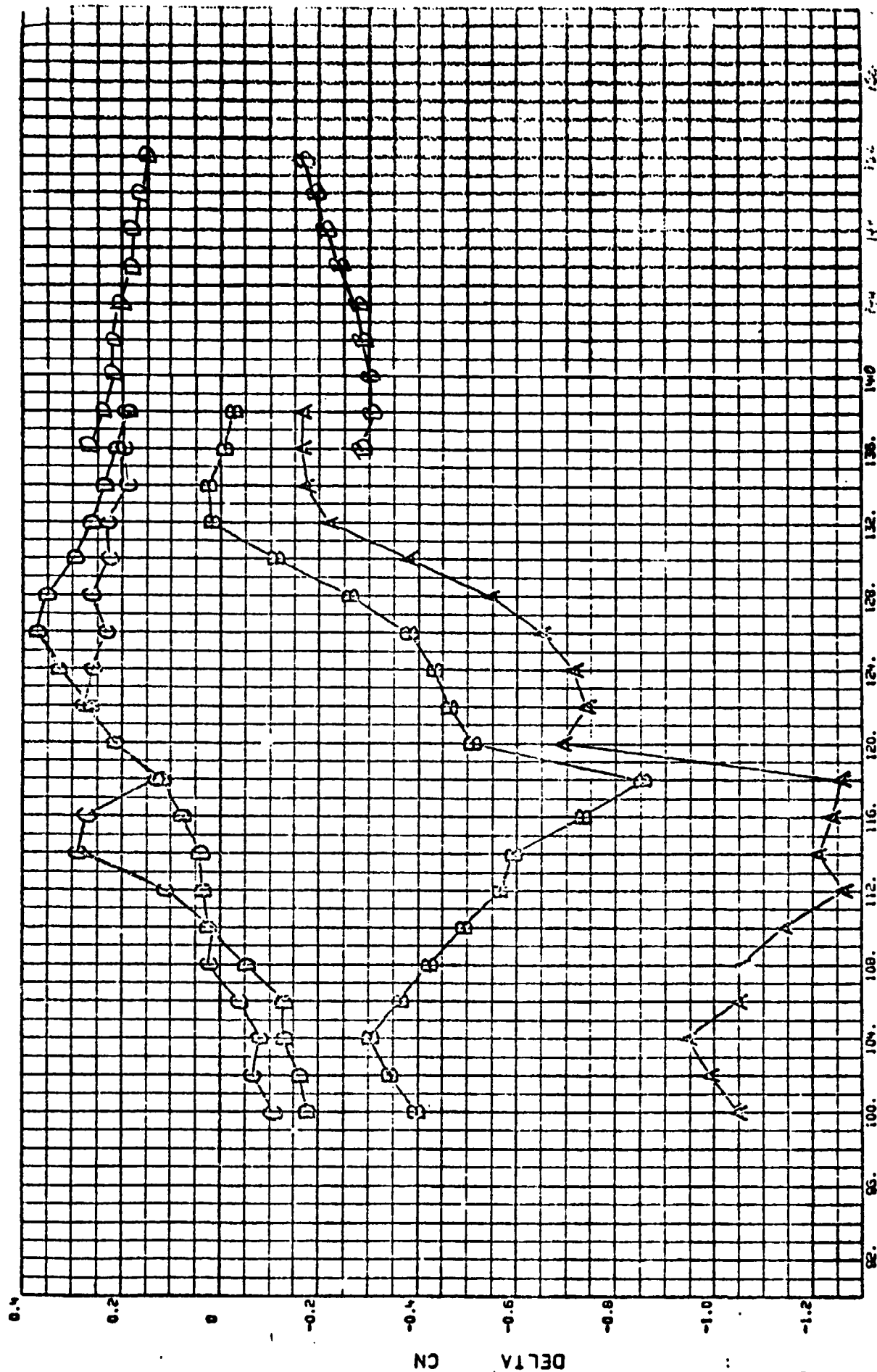
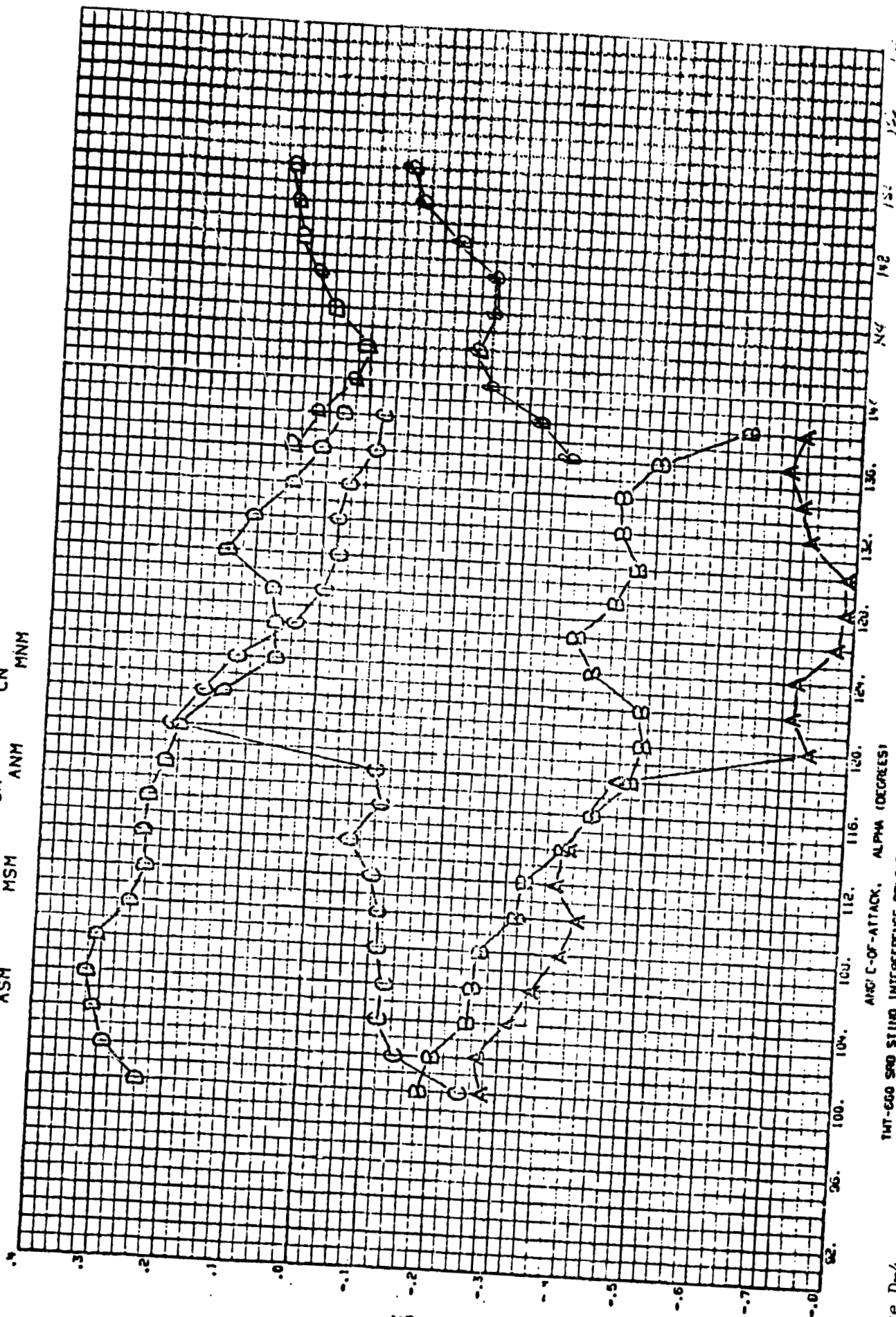


Figure D-3 String Interference versus Angle of Attack,  $C_N$ ,  $M_\infty = 0.6$ ,  $\phi = 90^\circ$

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MACH = .301  
ROLL = .0

A CN ASM B CN MSM C CN ANM D CN MNM E



AND C-OF-ATTACK, ALPHA (DEGREES)

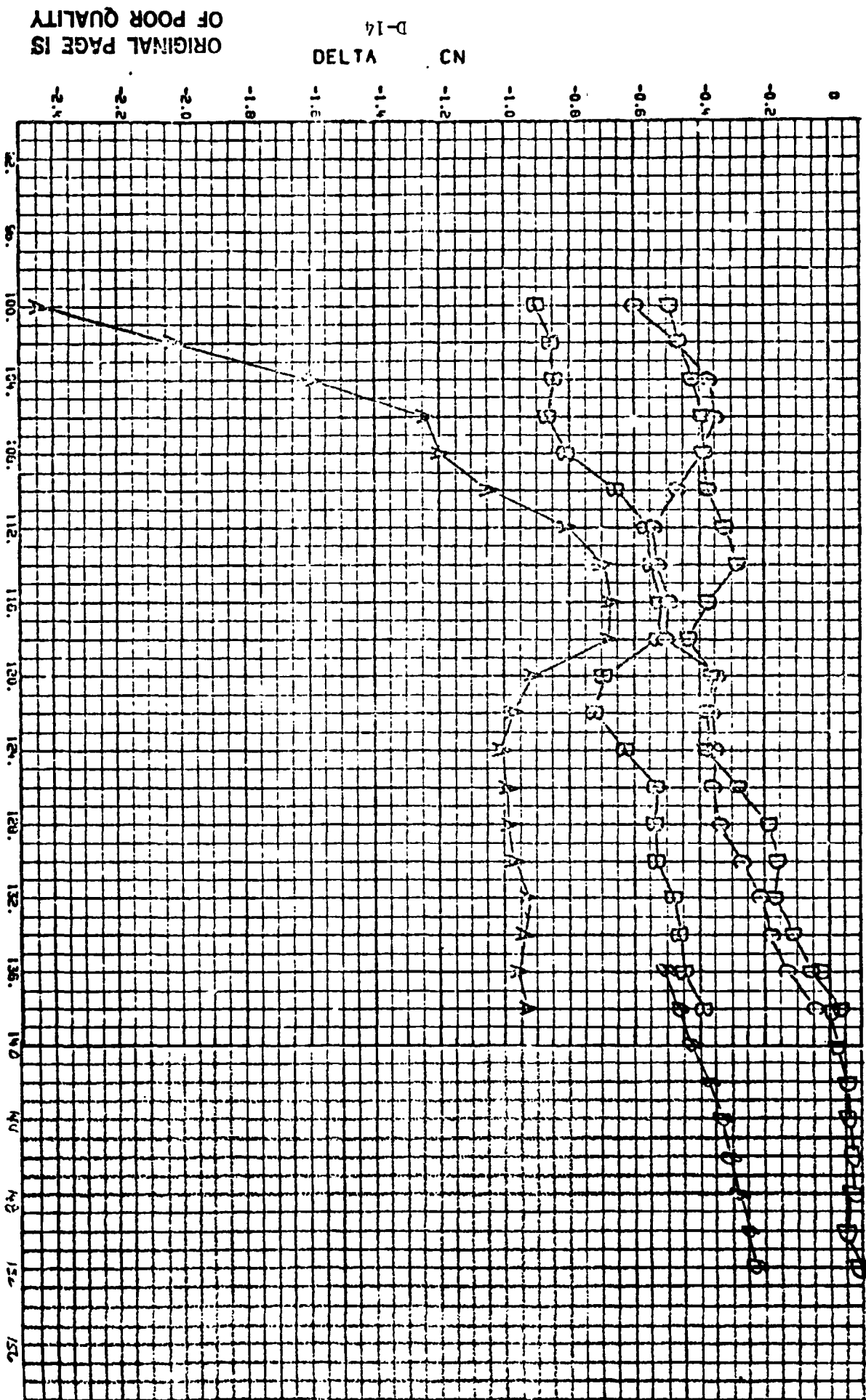
STING INTERFERENCE VERSUS ANGLE OF ATTACK,  $C_N, M_\infty = 0.9, \psi = 0^\circ$

Figure D-4

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OF POOR QUALITY

MACH=1.200  
ROLL = .0

A CN  
ASH  
B CN  
MSH  
C CN  
ANM  
D CN  
MNM  
E



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D-14

Figure D-5 Sting Interference versus Angle of Attack,  $C_N$ ,  $M_\infty = 1.2$ ,  $\phi = 0^\circ$

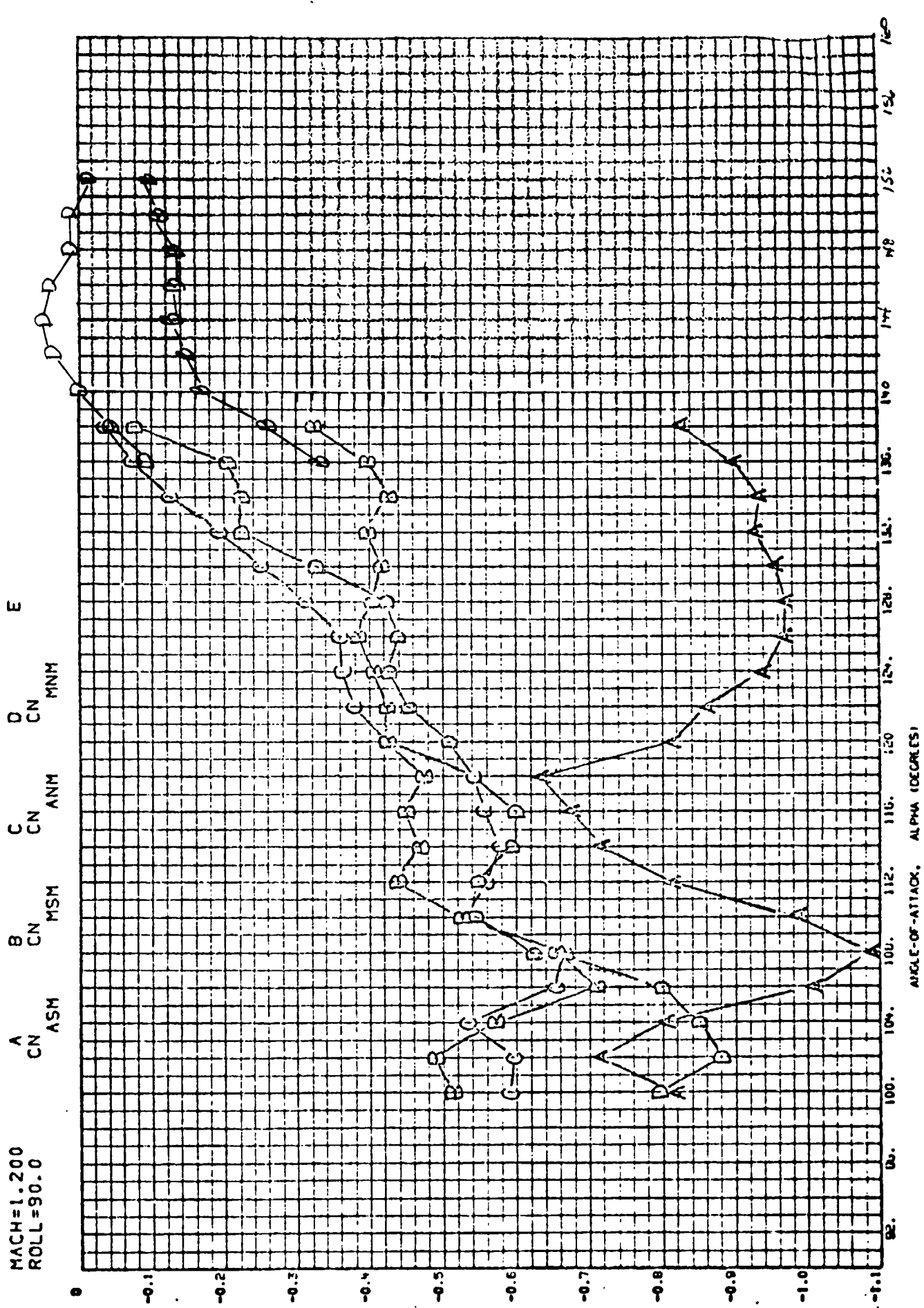


Figure D-6 Sting Interference versus Angle of Attack,  $C_N$ ,  $M_\infty = 1.2$ ,  $\phi = 90^\circ$

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$MACH = .601$   
 $ROLL = .0$   
 A CM ASM B CM MSM C CM ANM D CM MNM E

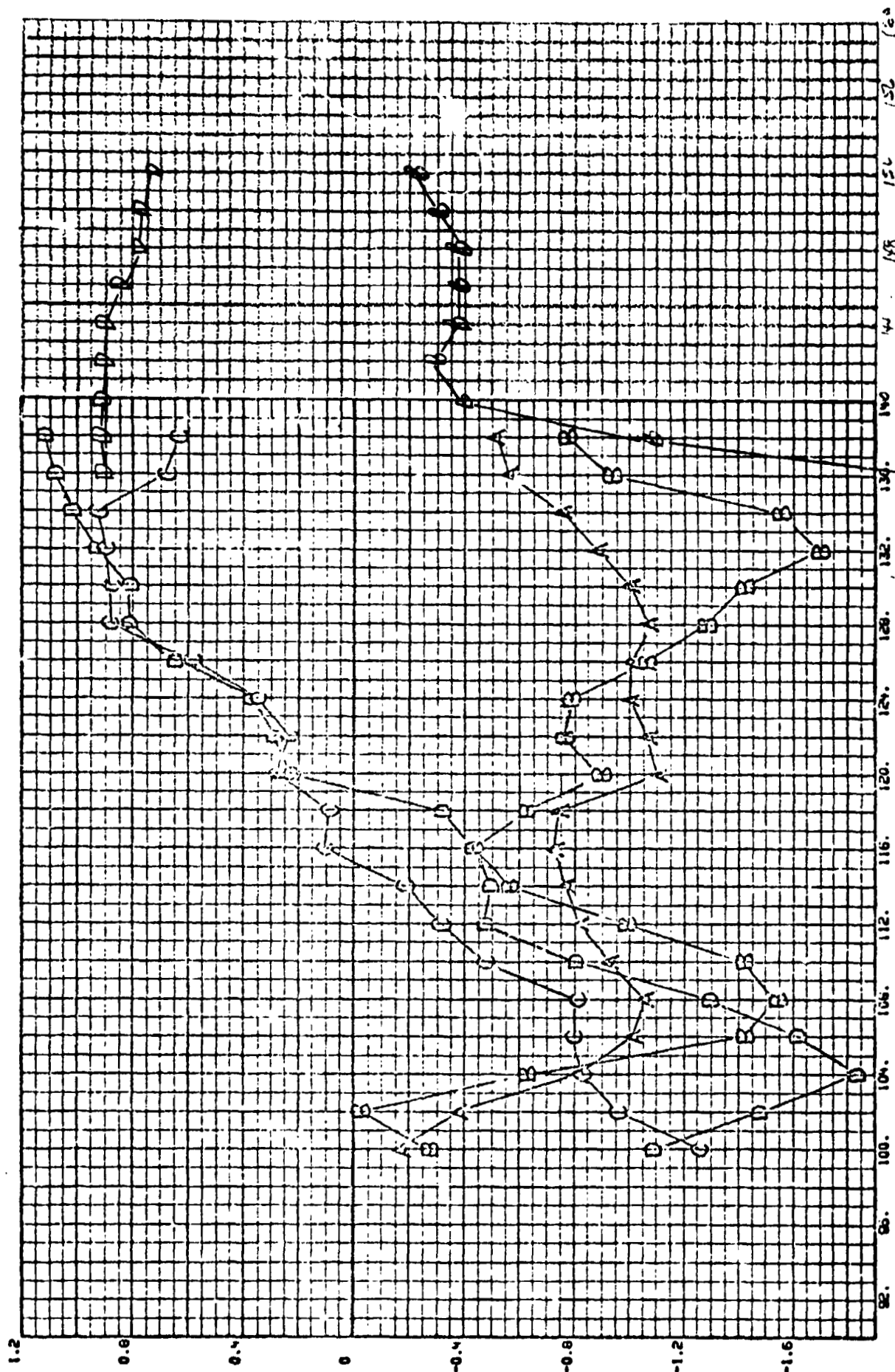
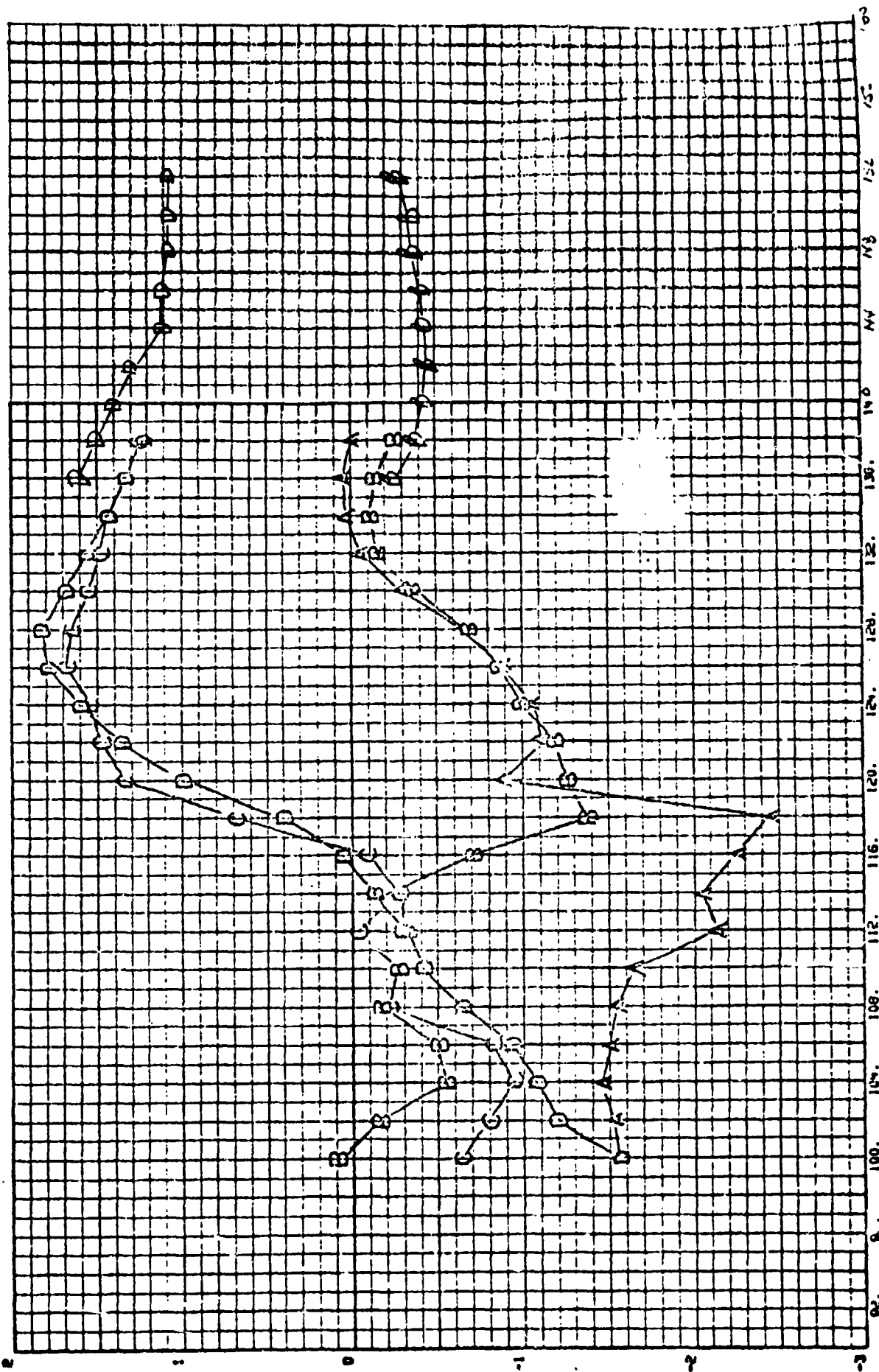


Figure D-7 Sting Interference versus Angle of Attack,  $C_M$ ,  $M_\infty = 0.6$ ,  $\phi = 0^\circ$   
 TWT-660 S8B STING INTERFERENCE DELTAS  
 ANGLE-OF-ATTACK, ALPHA (DEGREES)

MACH = .601  
ROLL = 90.0

A CM ASM  
B CM MSM  
C CM ANM  
D CM MNM  
E

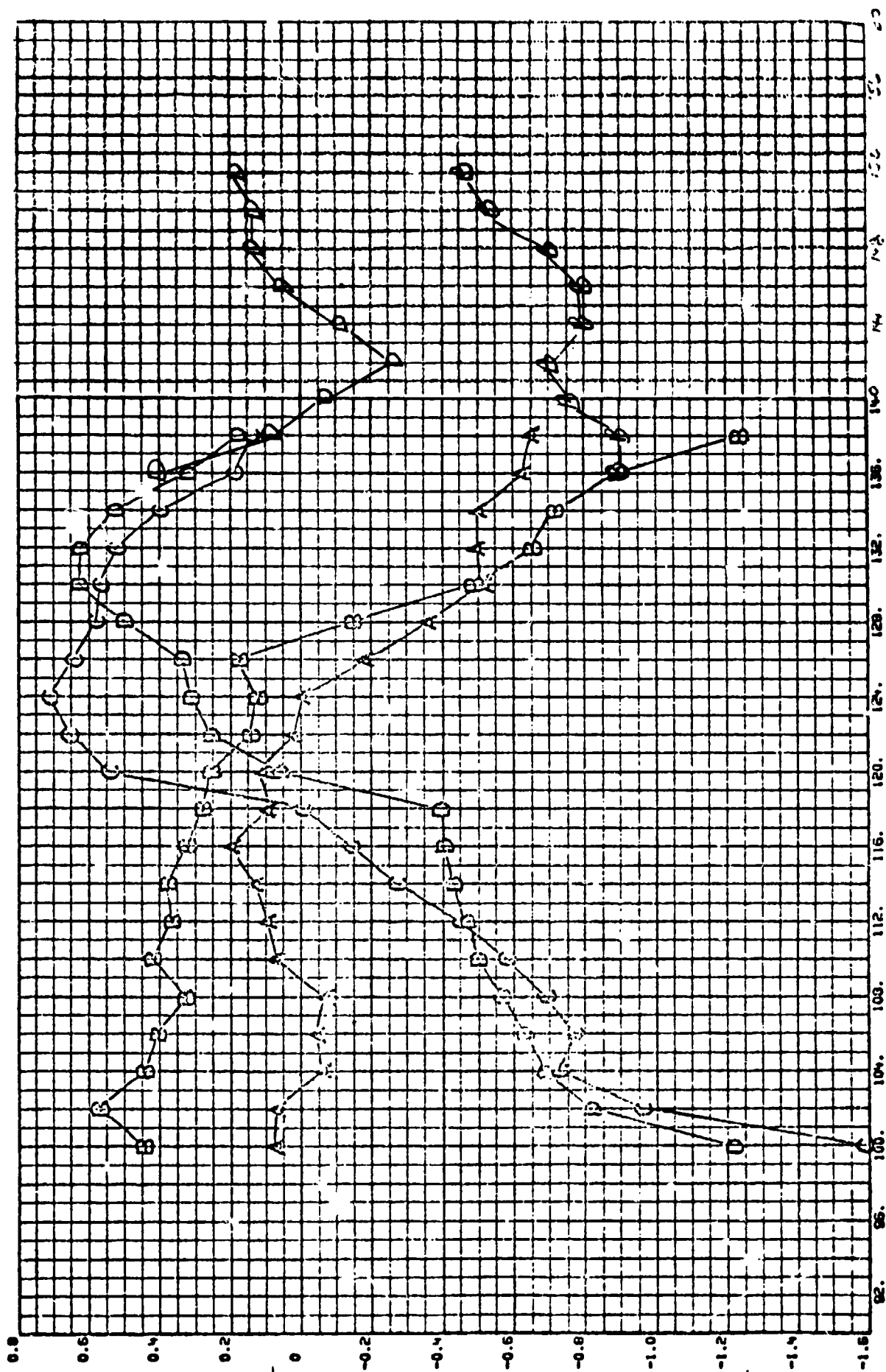


ANGLE-OF-ATTACK, ALPHA (DEGREES)

TWT-660 598 STING INTERFERENCE DELTAS

Figure D-8 Sting Interference versus Angle of Attack,  $C_M$ ,  $M_\infty = 0.6$ ,  $\phi = 90^\circ$

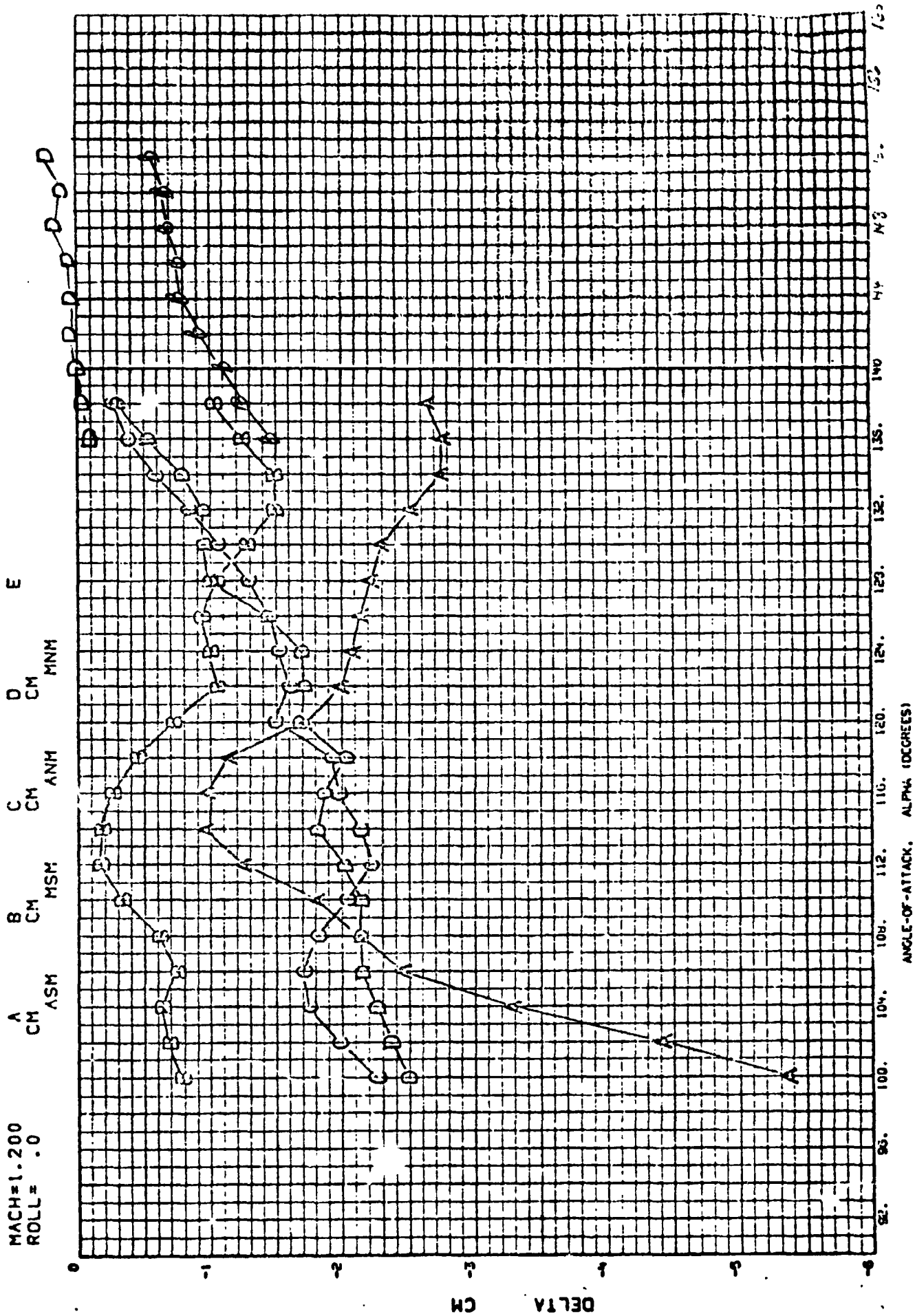
$M_{\text{REF}} = 0.0$   
 $\text{ROLL} = 0.0$   
 CM ASM CM MSN CM ANM CM MNM E



ANGLE-OF-ATTACK, ALPHA (DEGREES)

PT-660 900 STING INTERFERENCE DELTAS

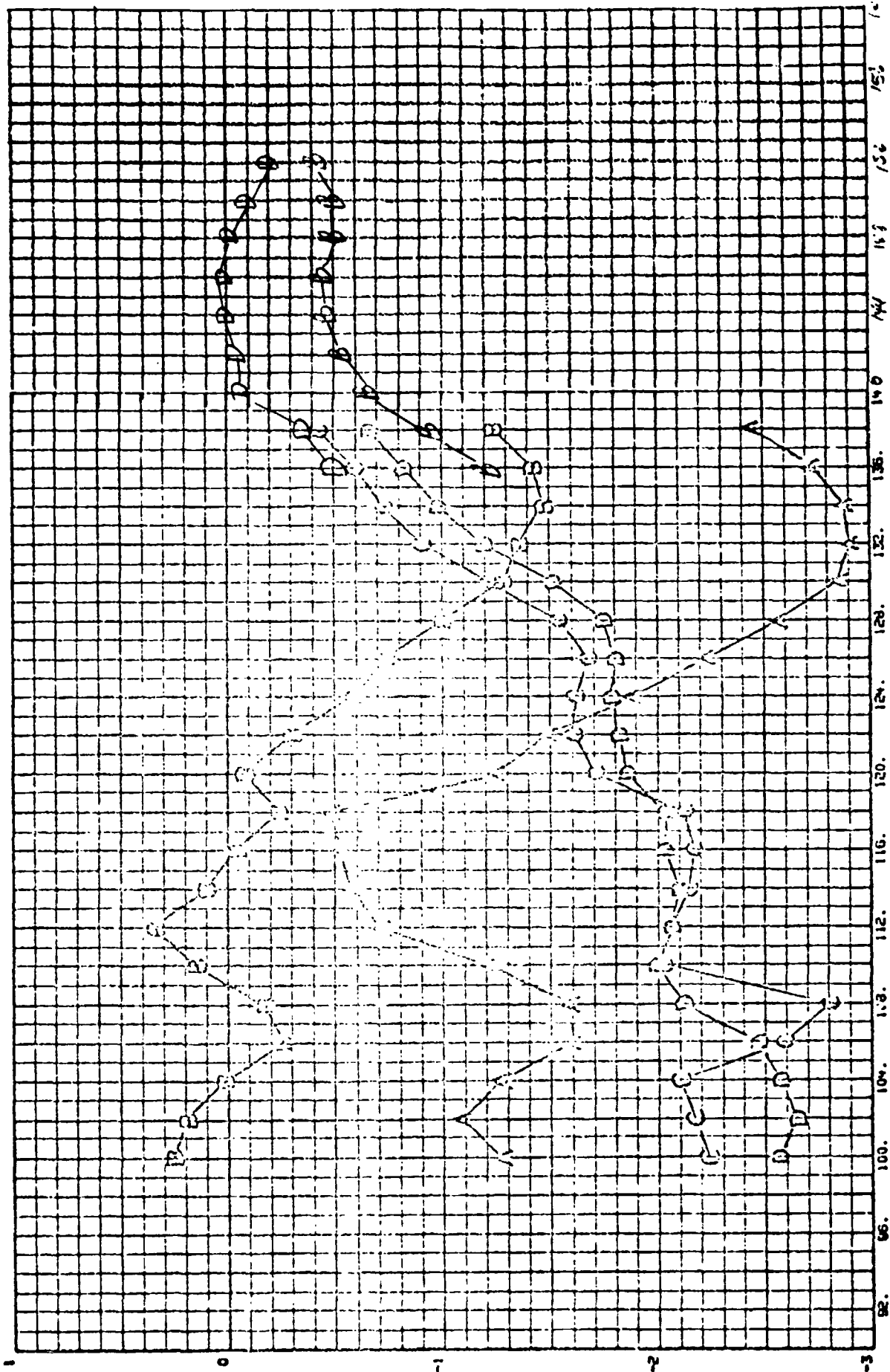
Figure D-9 Sting Interference versus Angle of Attack,  $C_M, M_\infty = 0.9, \phi = 0^\circ$



THT-650 SSB STING INTERFERENCE DELTAS  
 Figure D-10 Sting Interference versus Angle of Attack,  $C_M$ ,  $M_\infty = 1.2$ ,  $\phi = 0^\circ$

MACH=1.200  
 ROLL=90.0

A CM ASM B CM MSM C CM ANM D CM MNM E



CM V1730

D-20

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Figure D-11 Sting Interference versus Angle of Attack,  $C_M$ ,  $M_\infty = 1.2$ ,  $\phi = 90^\circ$

SYM. CONFIGURATION  
X TAPE 2,5  
I- TWT 660  
CORRECTED DATA  
BAND

$M_{\infty} = 0.9$   
 $\phi = 90^{\circ}$

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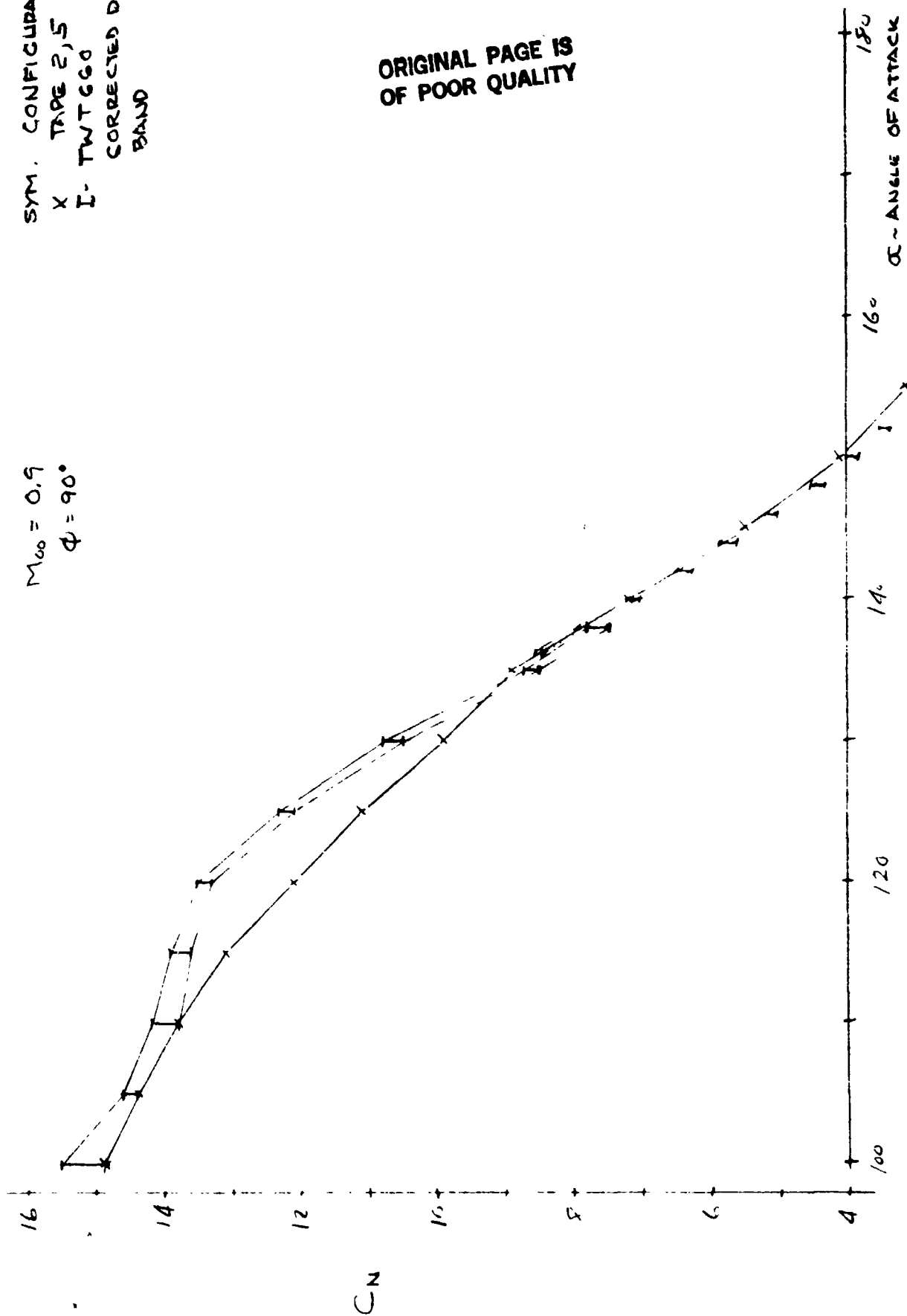


Figure D-12 - Normal Force Coefficient Versus  $\alpha$ ,  $M_{\infty} = 0.9$ ,  $\phi = 90$

MACH 1.10 PHI 9.00 RIGHT HAND SRB REENTRY CONF.

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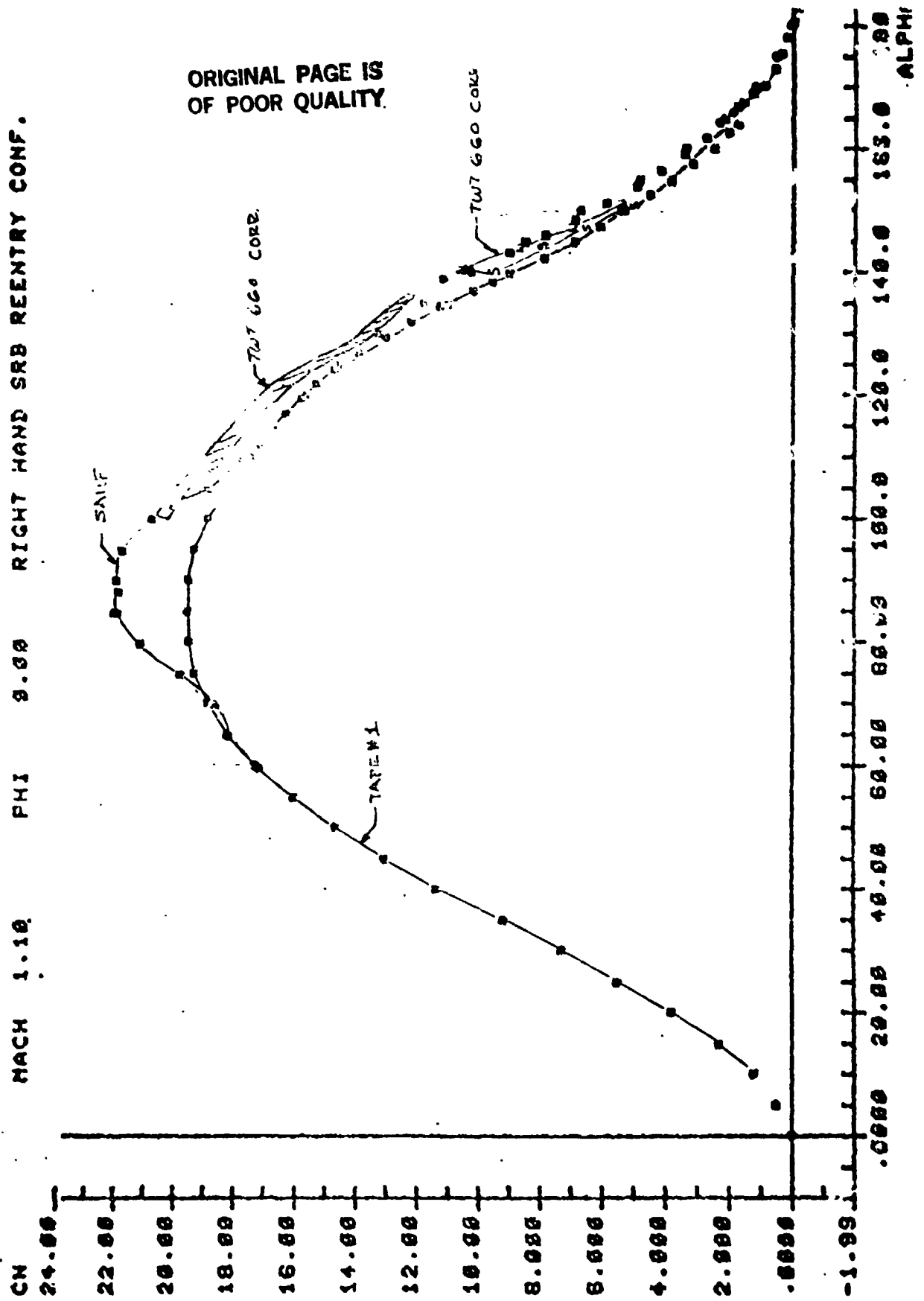


Figure D-13 Normal Force Coefficient Versus  $\alpha$ ,  $M_\infty = 1.1$ ,  $\phi = 0$

MACH 1.10. PHI 45.00 RIGHT HAND SRB REENTRY CONF.

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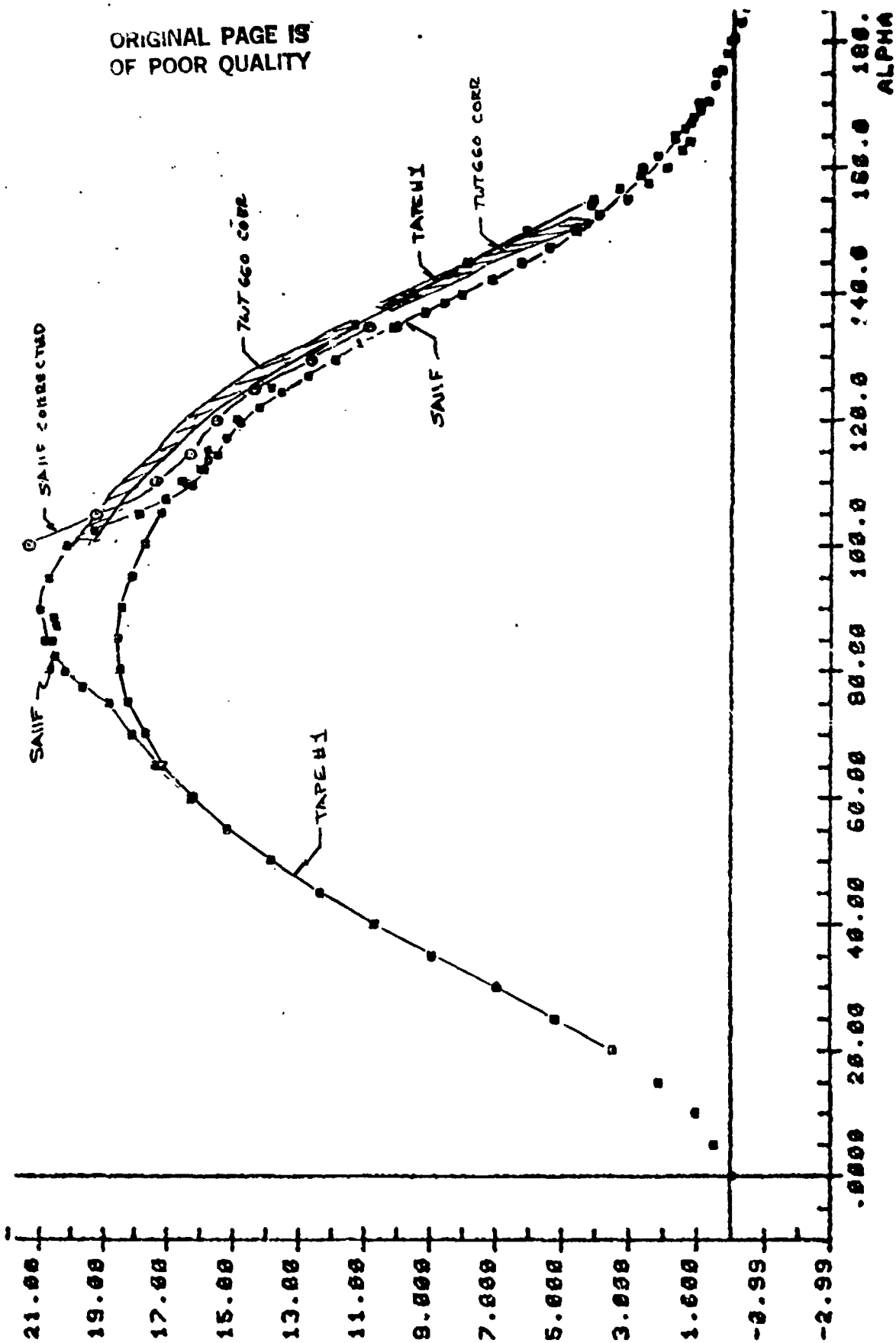
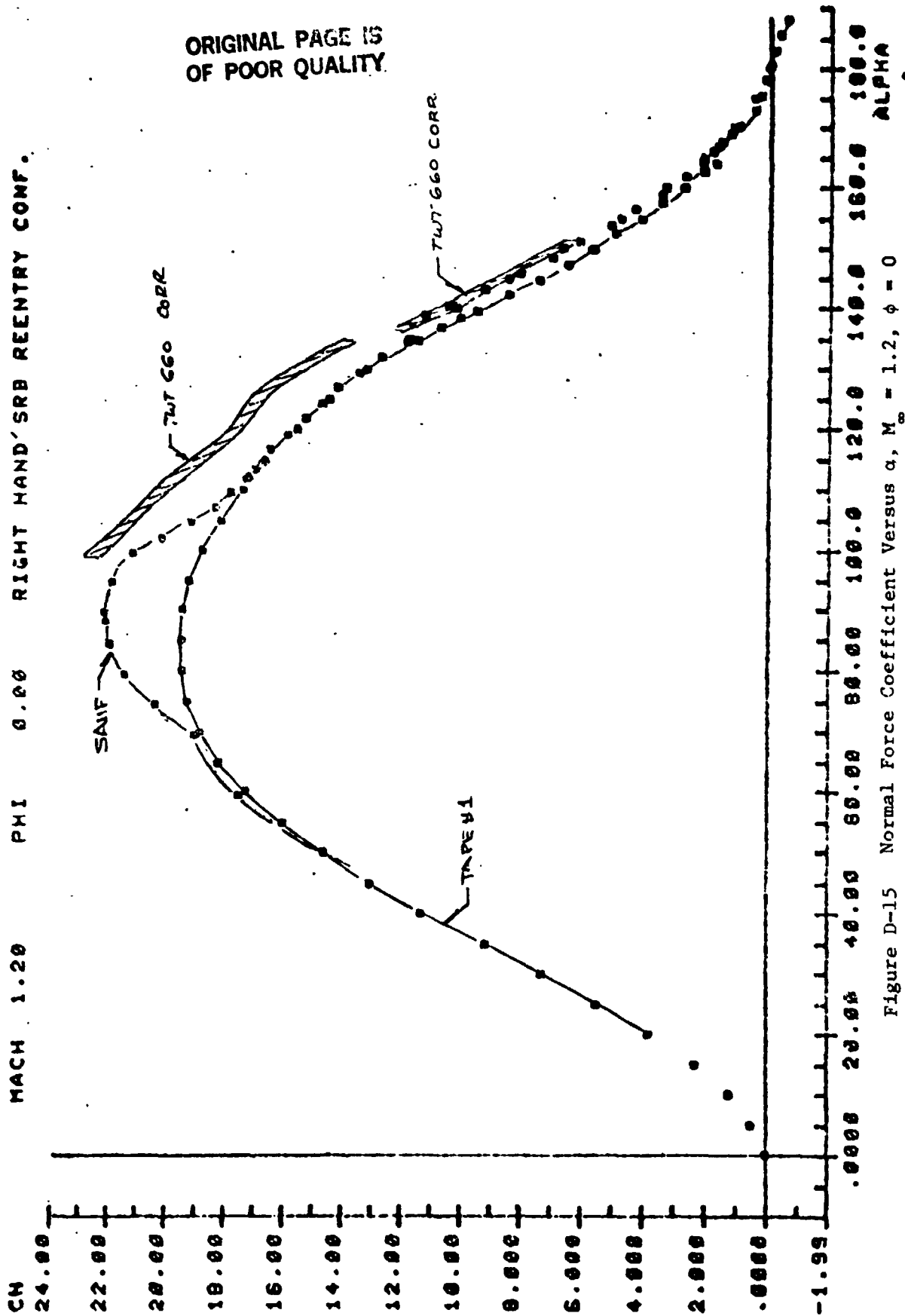


Figure D-14 Normal Force Coefficient Versus  $\alpha$ ,  $M = 1.1$ ,  $\phi = 45$



MACH 1.20 PHI 0.00 RIGHT HAND SRB REENTRY CONF.



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MACH 1.20 PHI 45.00 RIGHT HAND SRB REENTRY CONF.

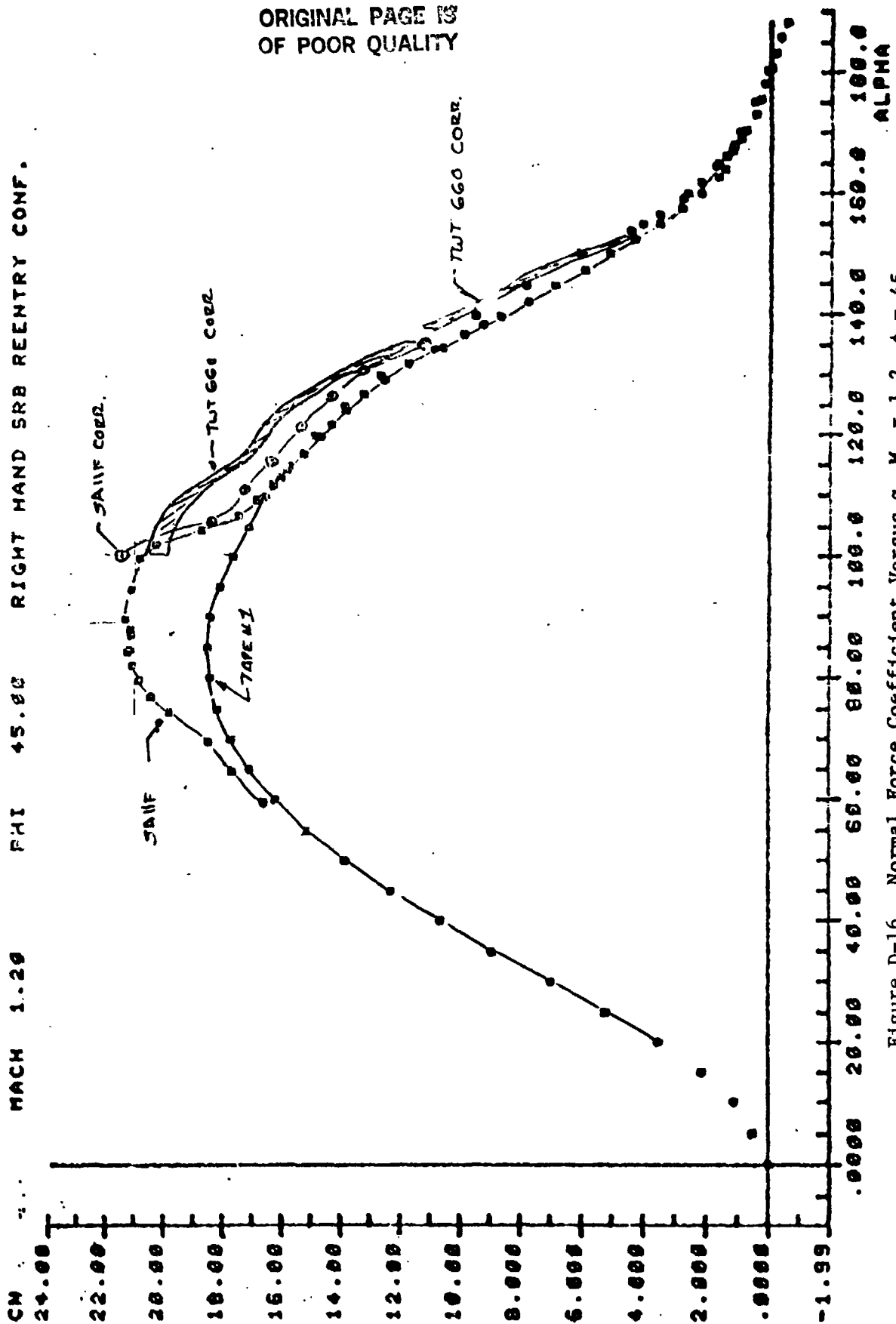


Figure D-16. Normal Force Coefficient Versus  $\alpha$ ,  $M_\infty = 1.2$ ,  $\phi = 45$

$M_{\infty} = 0.9$   
 $\phi = 0$

SYM. CONFIGURATION  
 X TAPE 2, 5  
 I TWT 660  
 CORRECTED DATA BAND  
 RANGE A, B  
 N, S TWT 660  
 CORRECTED DATA BAND  
 RANGE C

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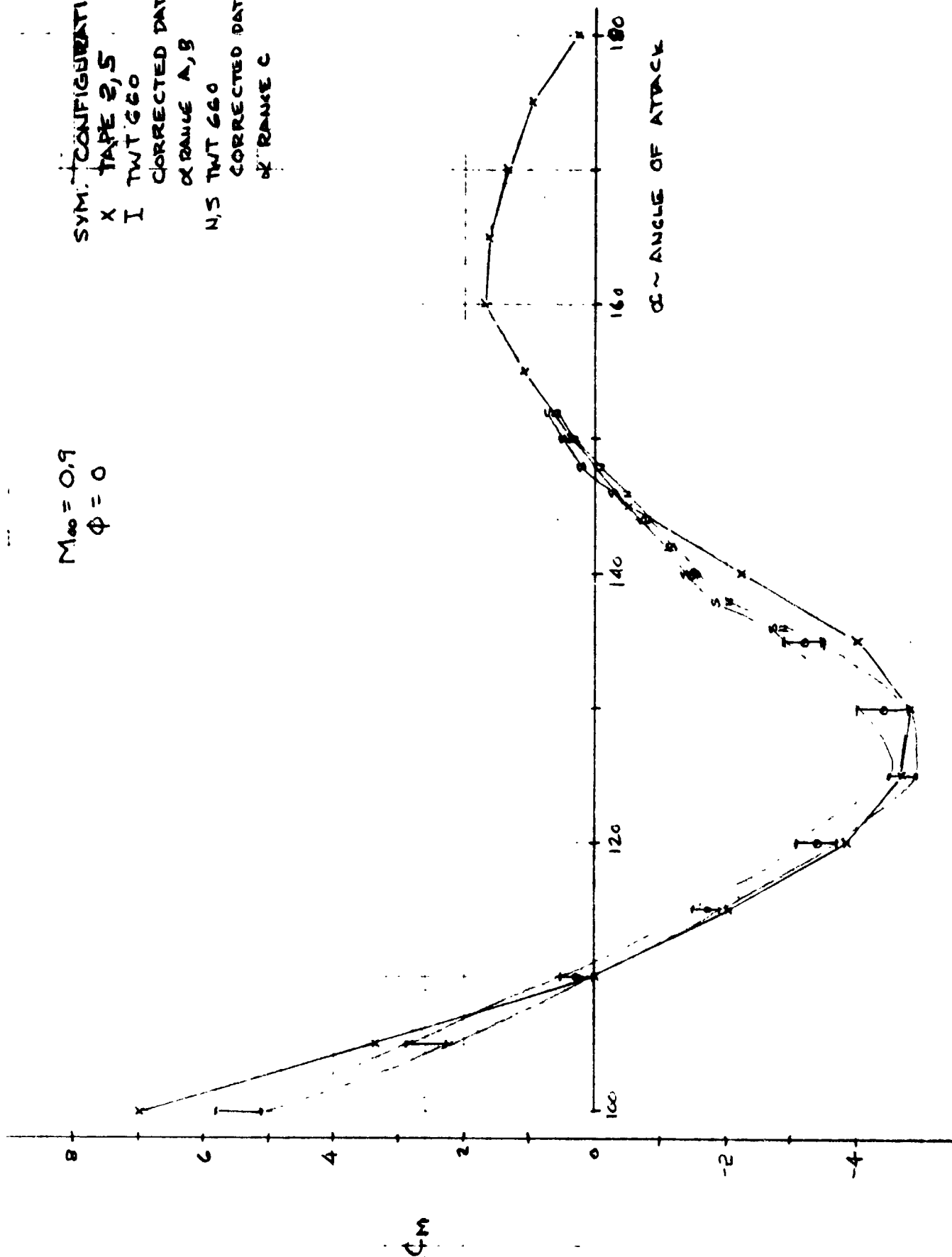


Figure D-17 - Pitching Moment Coefficient Versus  $\alpha$ ,  $M_{\infty} = 0.9$ ,  $\phi = 0^\circ$

$M_{\infty} = 0.9$   
 $\phi = 45^\circ$

SYM. CONFIGURATION

X TAPE 2,5

I TWT 660

CORRECTED DATA BAND

$\alpha$  RANGE A,B

N,3 TWT 660

CORRECTED DATA BAND

$\alpha$  RANGE C

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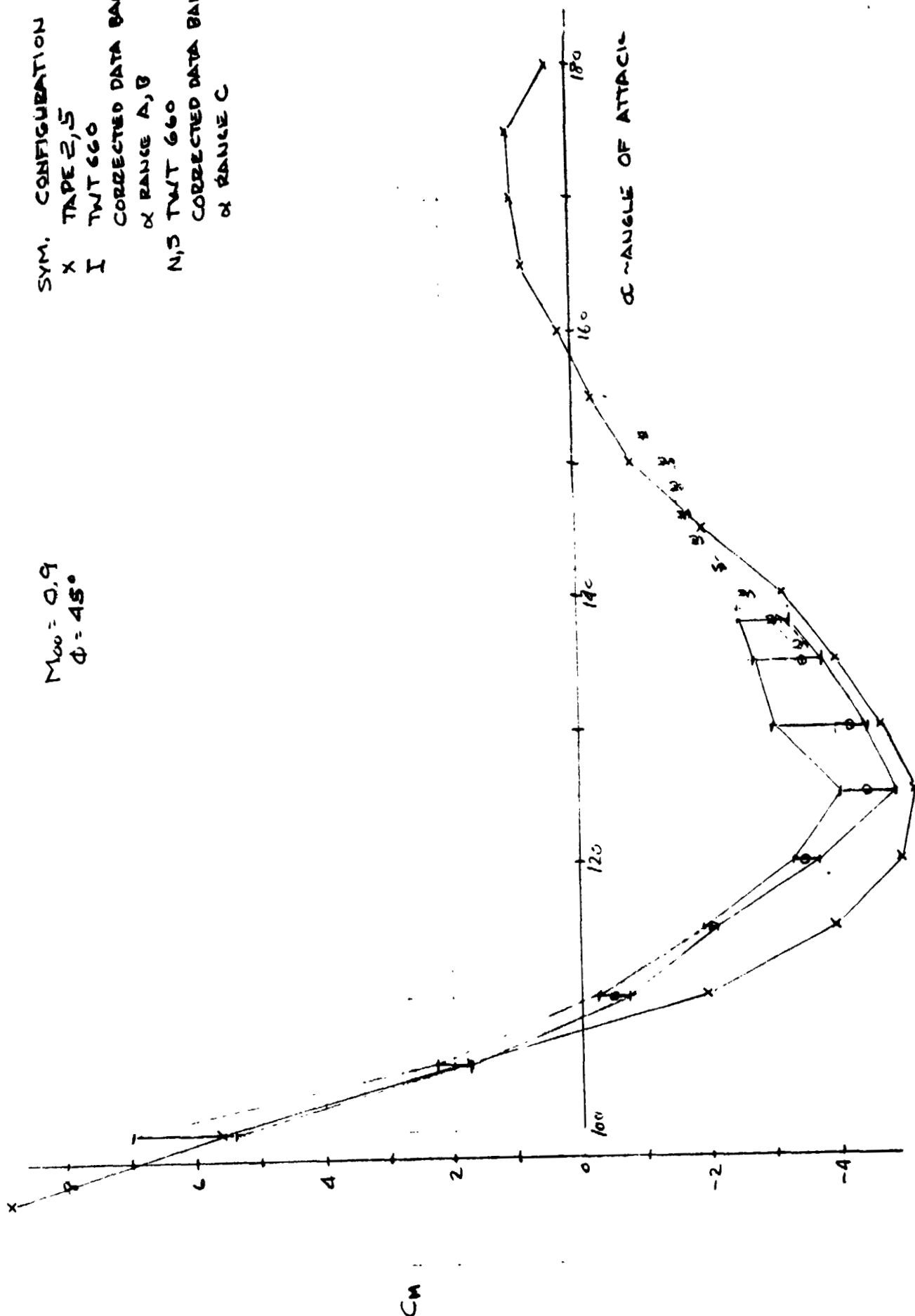


Figure D-18 - Pitching Moment Coefficient Versus  $\alpha$ ,  $M_{\infty} = 0.9$   $\phi = 45^\circ$

$M_{\infty} = 0.9$   
 $\phi = 90^\circ$

SYM. CONFIGURATION  
 X - TAPE 2,5  
 I - TWT 660  
 CORRECTED DATA BAND  
 $\alpha$  RANGE A,B  
 N.S - TWT 660  
 CORRECTED DATA BAND  
 $\alpha$  RANGE C

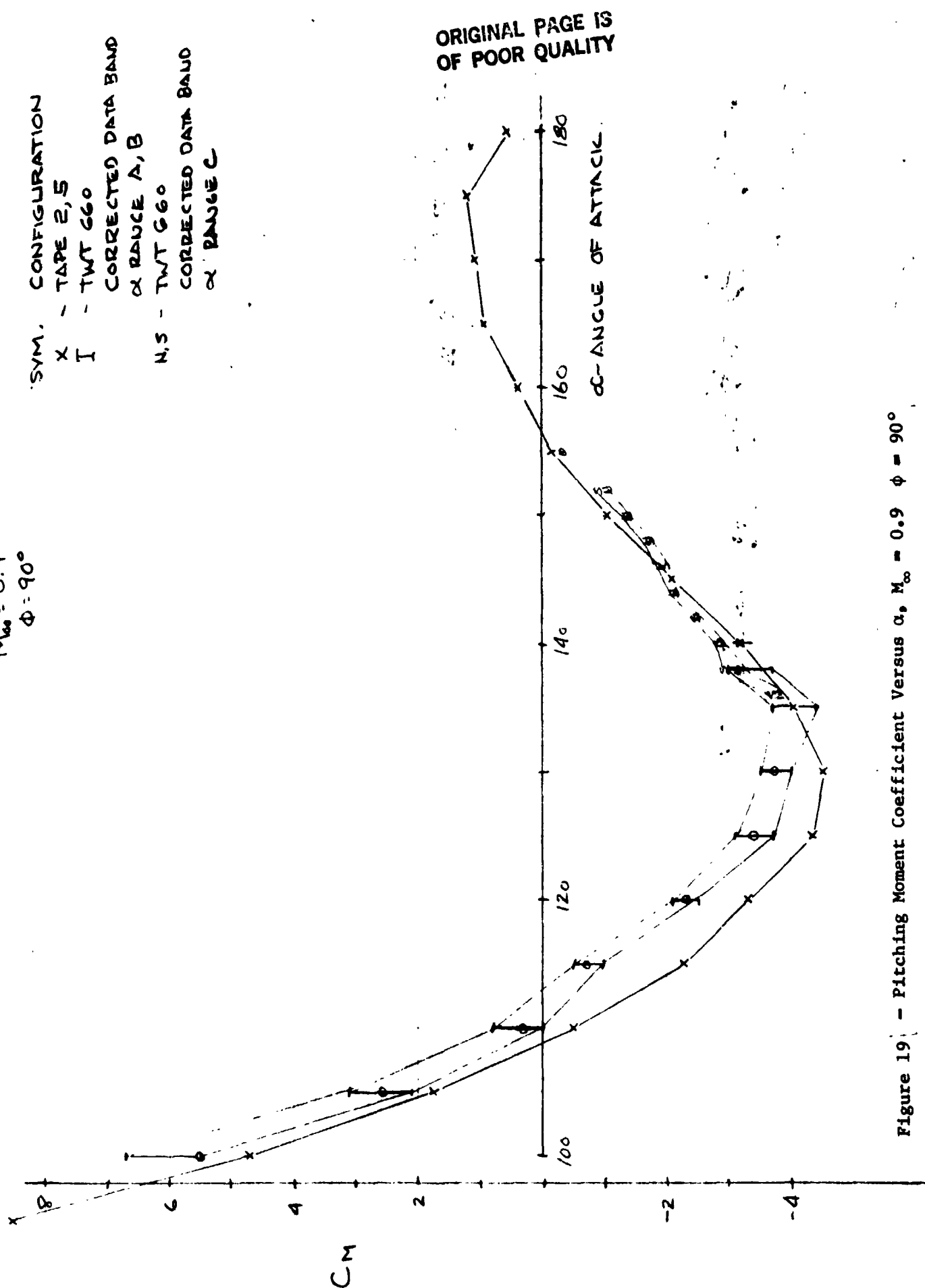


Figure 19 - Pitching Moment Coefficient Versus  $\alpha$ ,  $M_{\infty} = 0.9$   $\phi = 90^\circ$

MACH 1.10 PHI 3.00 RIGHT HAND SRB REENTRY CONF.

CM

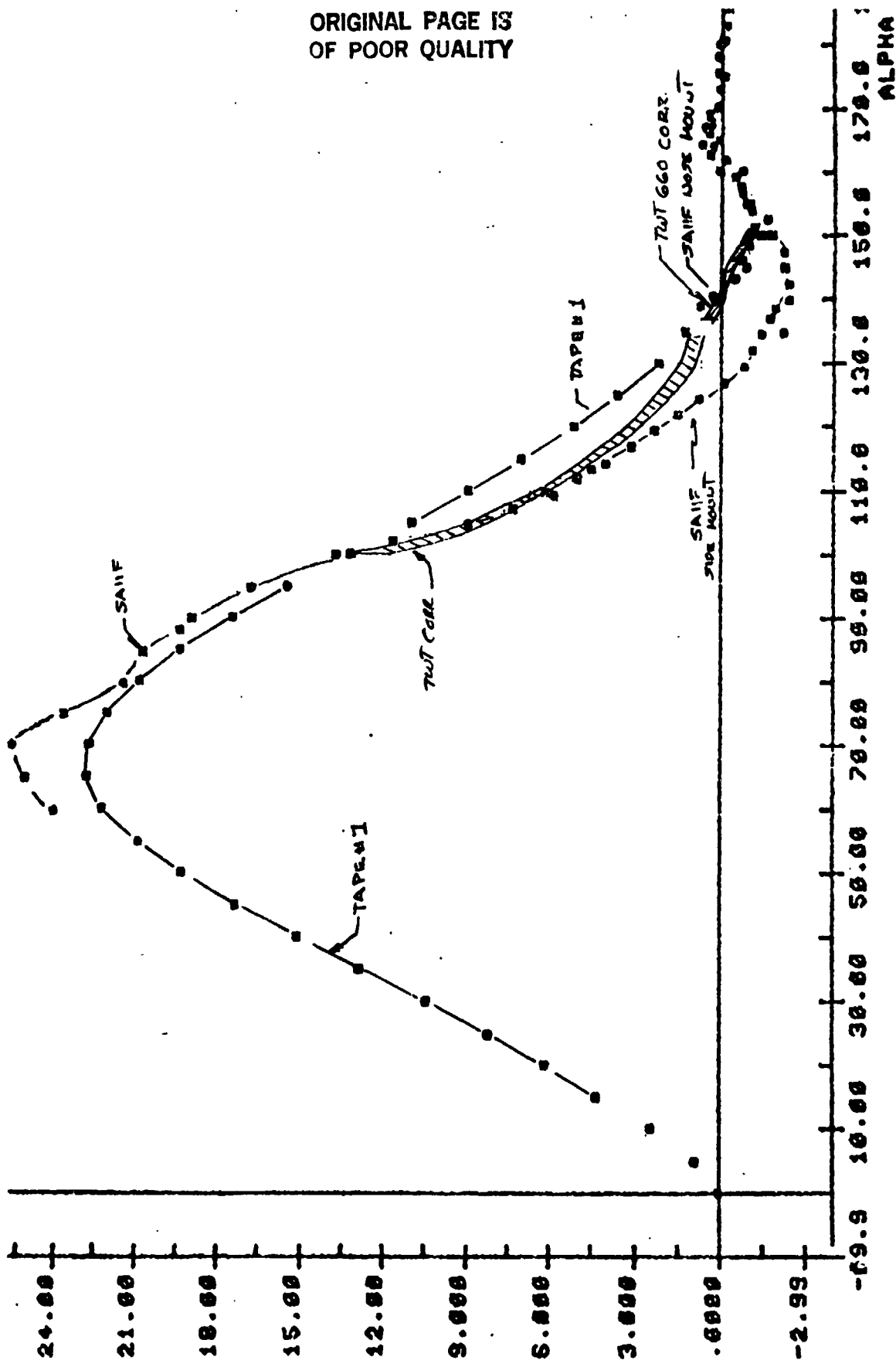


Figure D-20 Pitching Moment Coefficient Versus  $\alpha$ ,  $M_\infty = 1.1$ ,  $\phi = 0$

HACH 1.10 PHI 45.60 RIGHT HAND SRB REENTRY CONF.

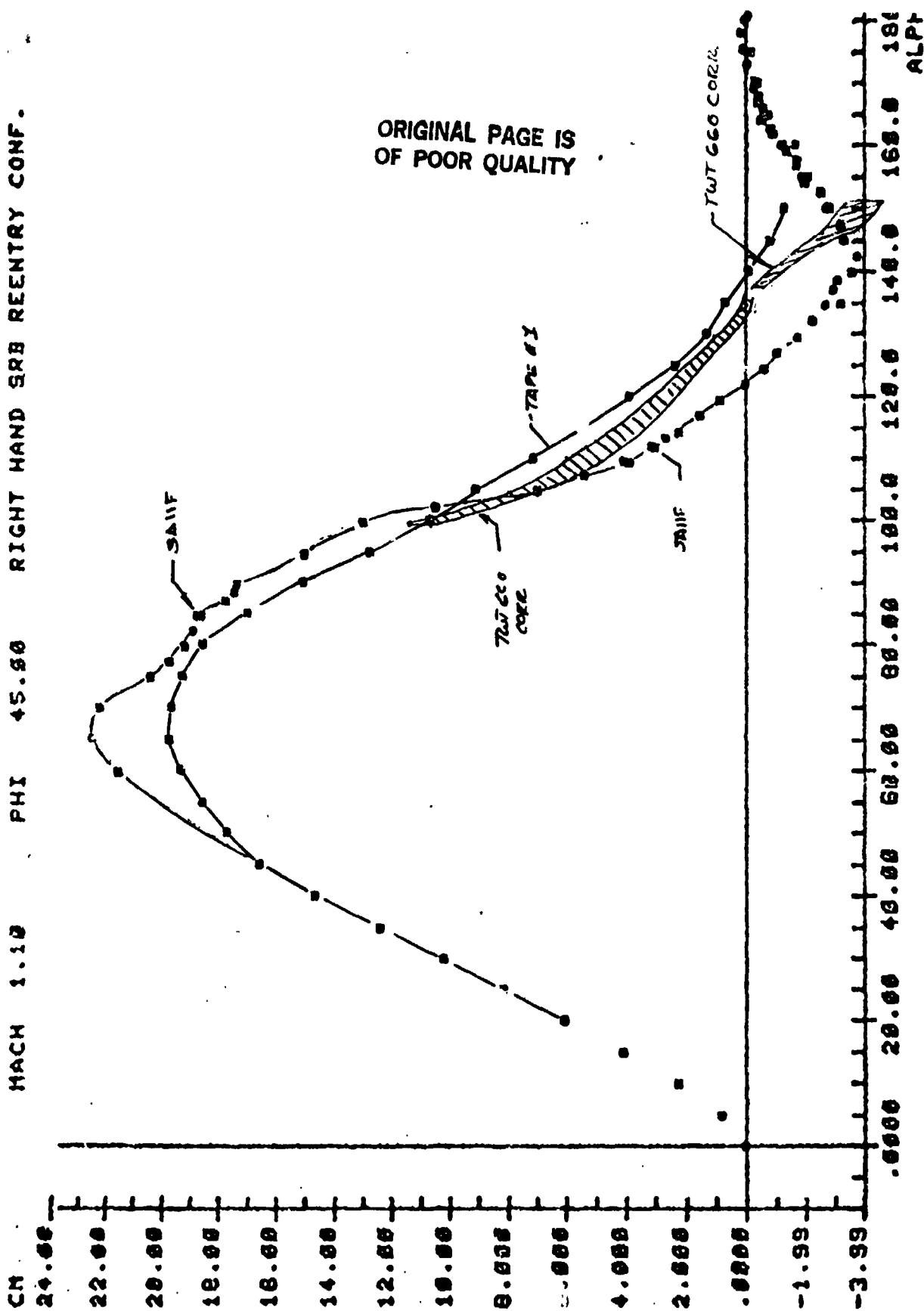


Figure D-21 Pitching Moment Coefficient Versus  $\alpha$ ,  $M_\infty = 1.1$ ,  $\phi = 45$

MACH 1.10 PHI 90.00 RIGHT HAND SRB REENTRY CONF.

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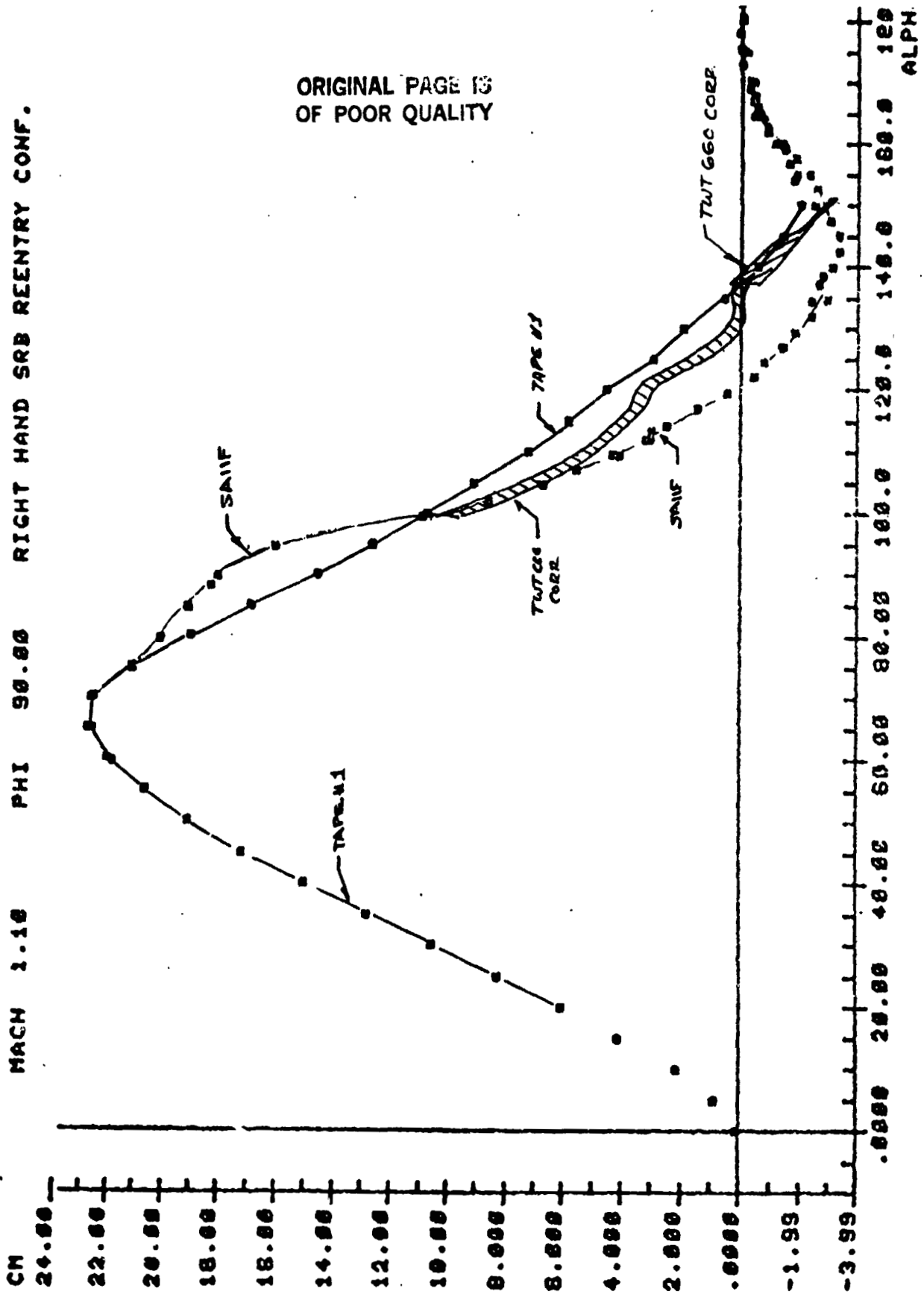


Figure D-22 Pitching Moment Coefficient Versus  $\alpha$ ,  $M_\infty = 1.1$ ,  $\phi = 50$



MACH 1.20 PHI 0.00 RIGHT HAND SRB REENTRY CONF.

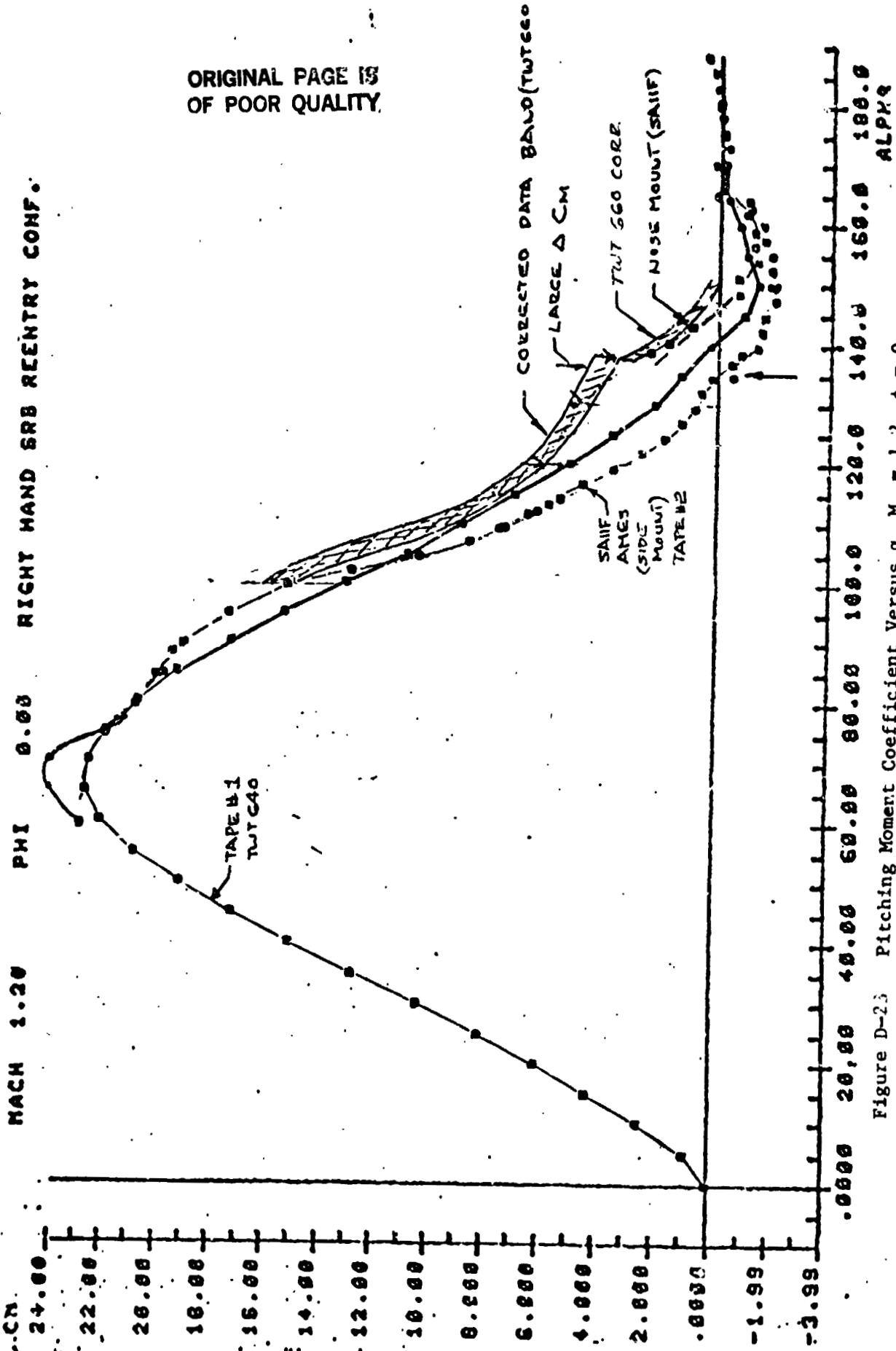


Figure D-23 Pitching Moment Coefficient Versus  $\alpha$ ,  $M_\infty = 1.2$ ,  $\phi = 0$

RIGHT HAND SRB REENTRY CONF.

PHI 45.00

MACH 1.20

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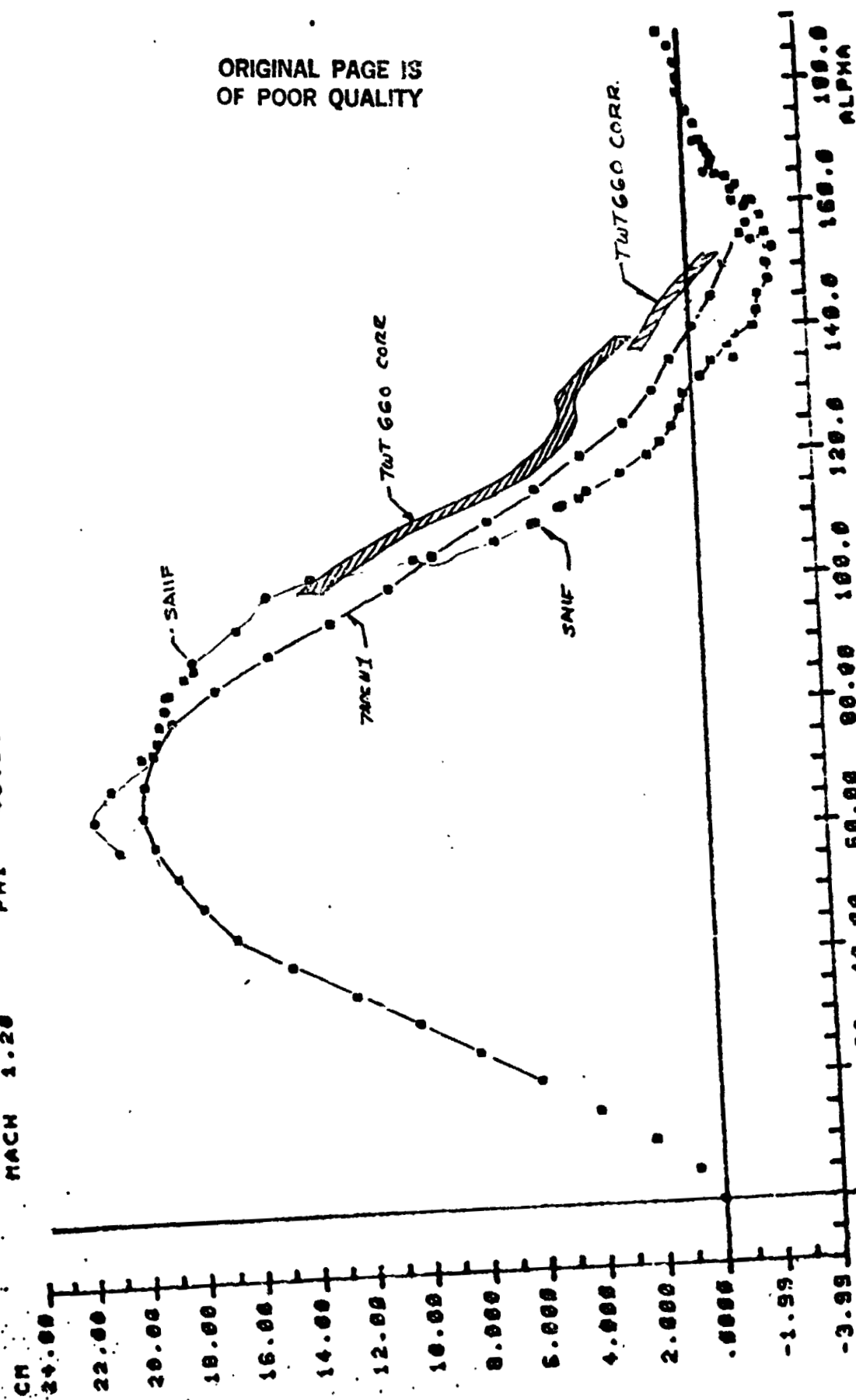


Figure D-24 Pitching Moment Coefficient Versus  $\alpha$ ,  $M_\infty = 1.2$ ,  $\phi = 45$

MACH 1.20 PHI 90.00 RIGHT HAND SRB REENTRY CONF.

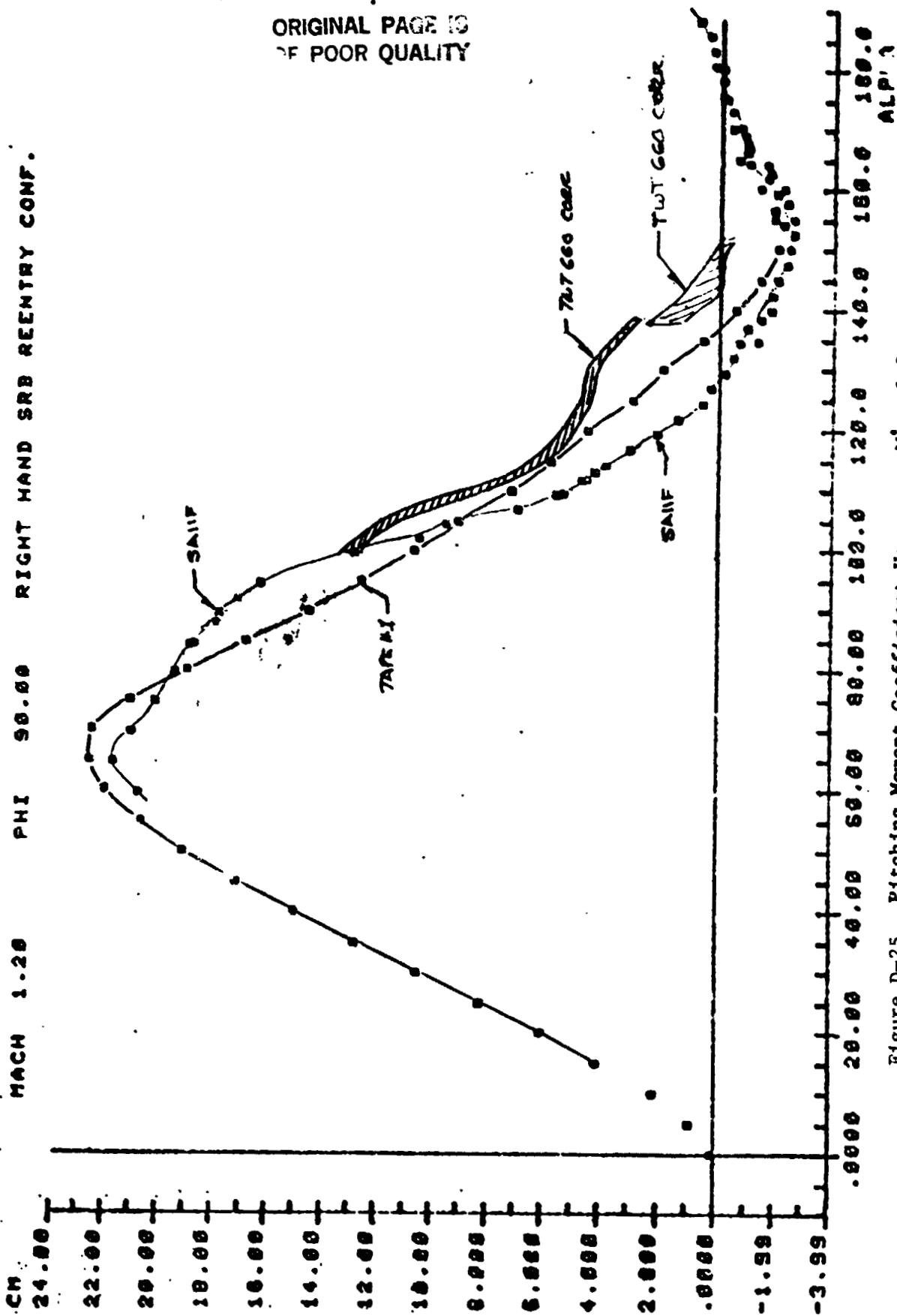


Figure D-25 Pitching Moment Coefficient Versus  $\alpha$ ,  $M_\infty = 1.2$ ,  $\phi = 90$

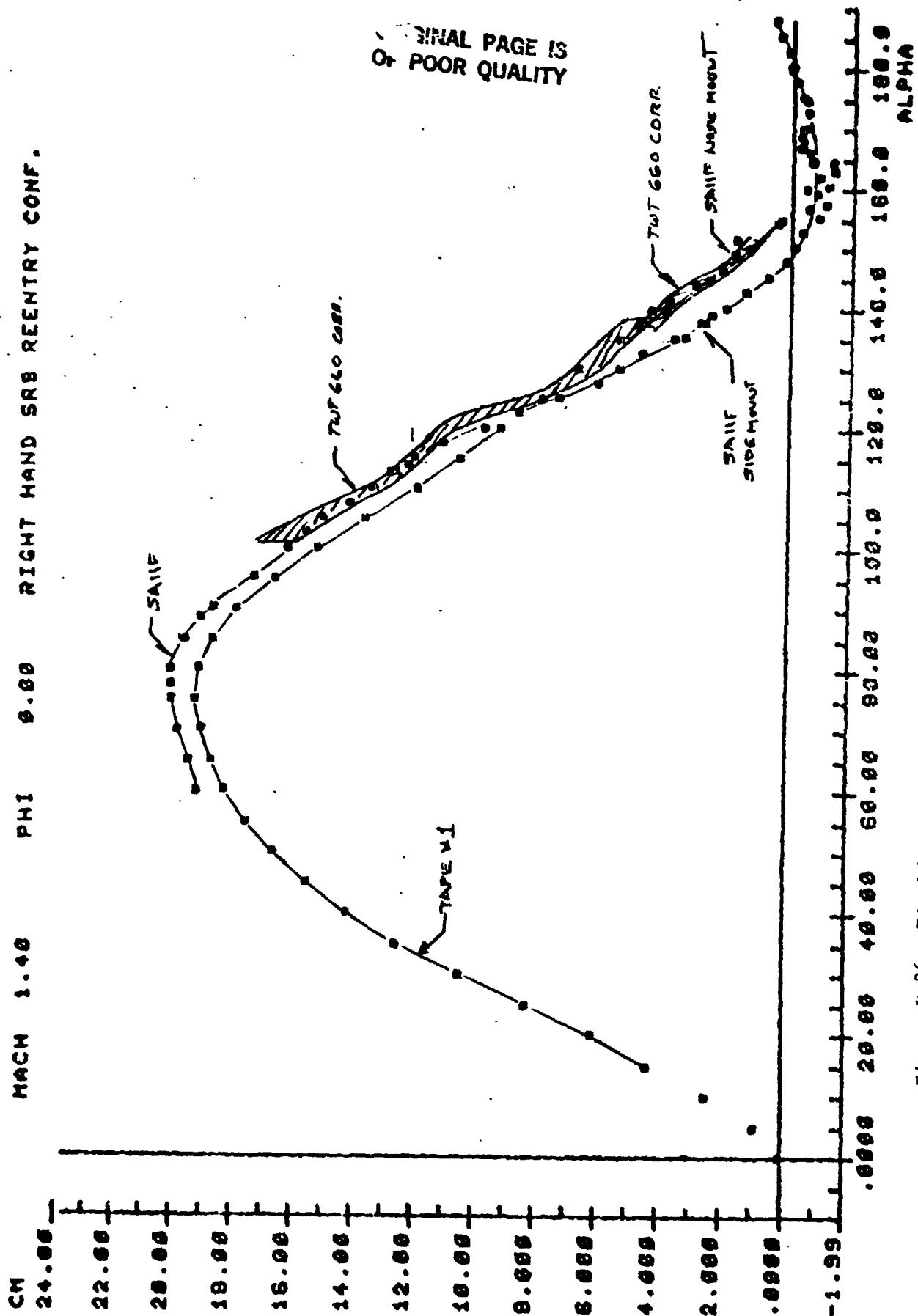


Figure D-26 Pitching Moment Coefficient Versus  $\alpha$ ,  $M_\infty = 1.4$ ,  $\phi = 0$

$M_\infty = 1.1$   
 $\phi = 0^\circ$   
 N - NOSE MOUNT  
 S - SIDE MOUNT  
 □ - TAPE 5

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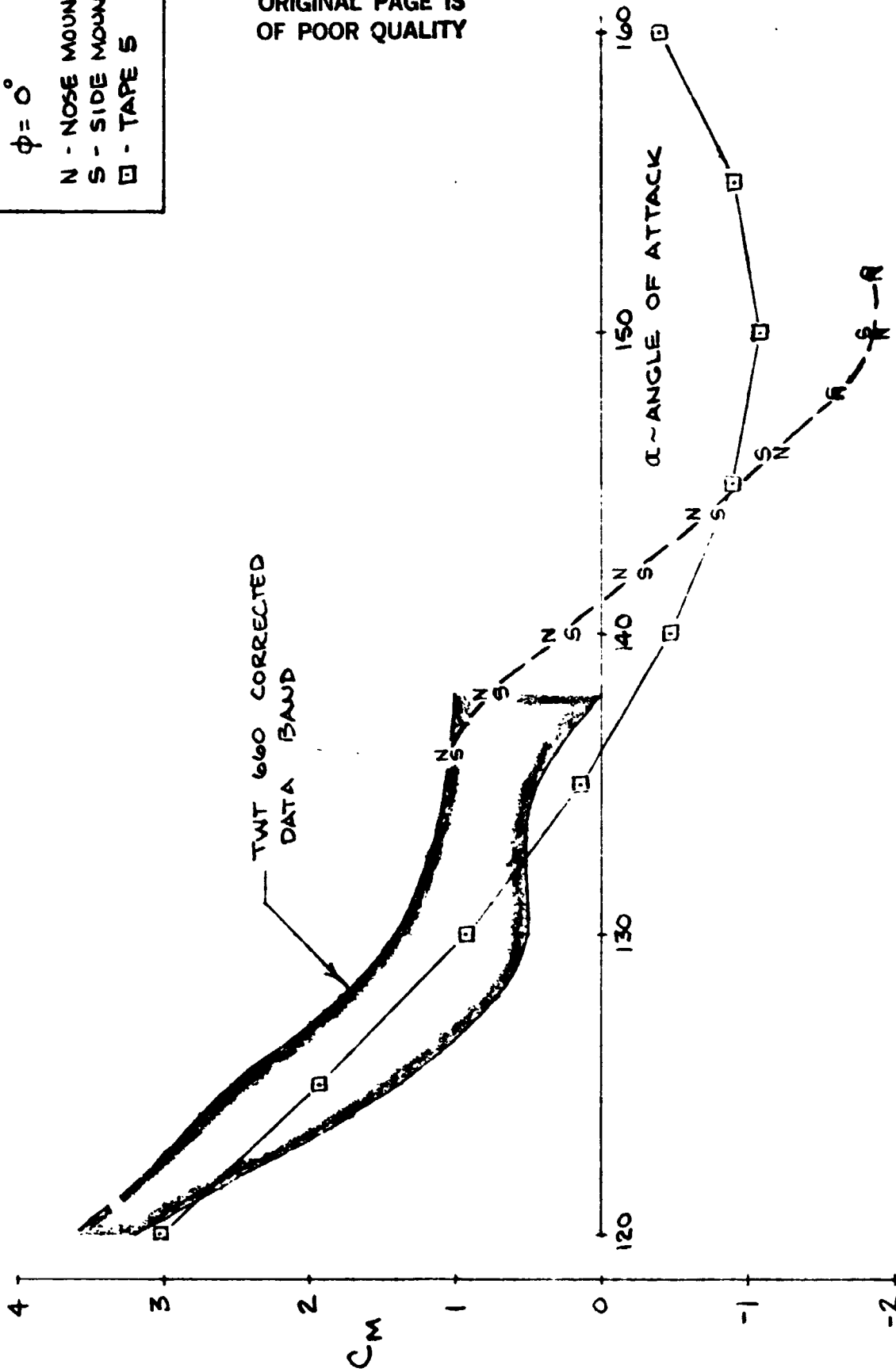


Fig. D-27 - Summary Pitching Moment Data,  $M_\infty = 1.1$ ,  $\phi = 0$  deg

$M_{\infty} = 1.1$   
 $\phi = 90^\circ$   
 N - NOSE MOUNT  
 S - SIDE MOUNT  
 □ - TAPE S

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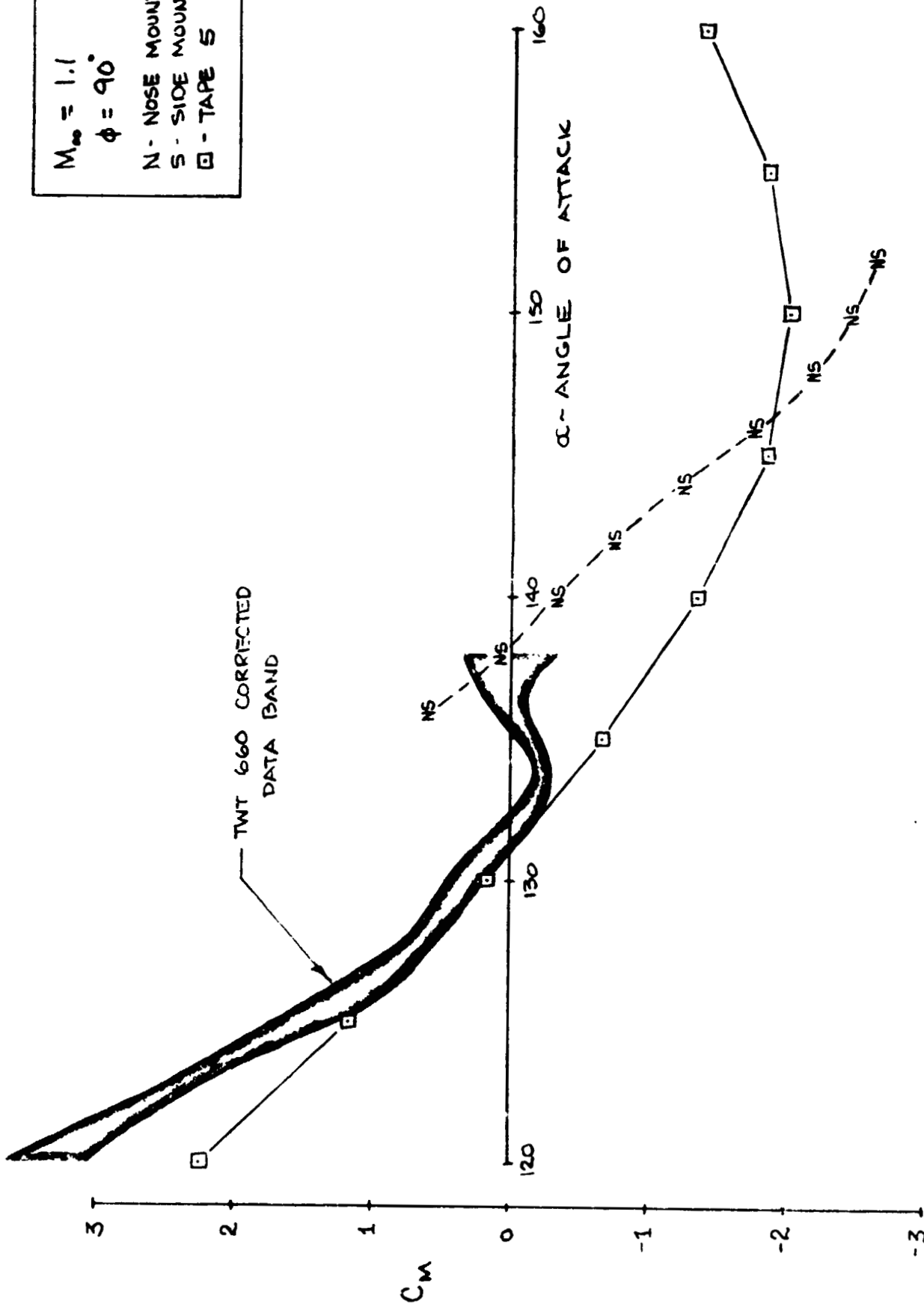


Fig. D-28 - Summary Pitching Moment Data,  $M_{\infty} = 1.1$ ,  $\phi = 90^\circ$

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$$M_{\infty} = 1.2$$

$$\phi = 0^{\circ}$$

N - NOSE MOUNT  
S - SIDE MOUNT  
□ - TAPE 5

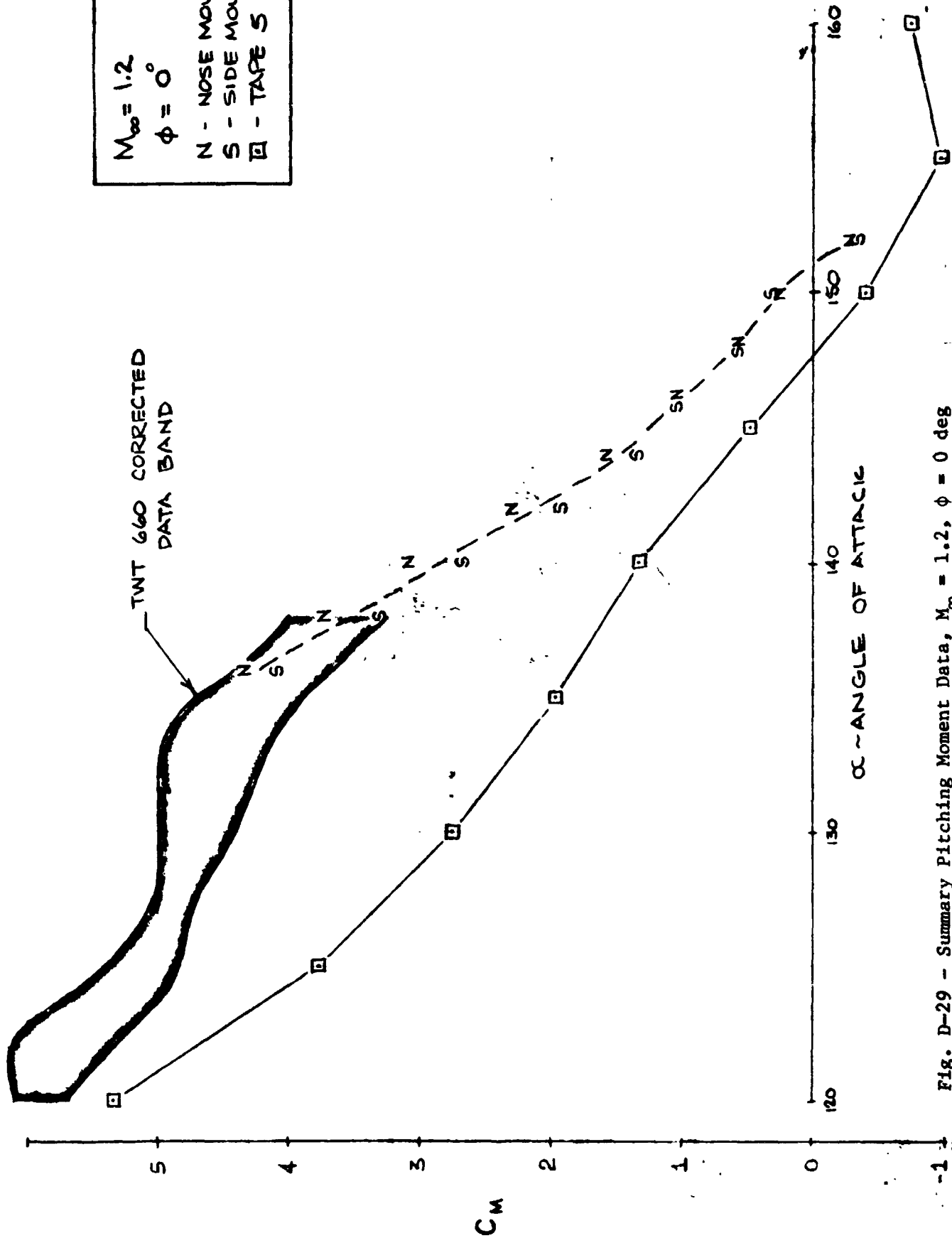


Fig. D-29 - Summary Pitching Moment Data,  $M_{\infty} = 1.2$ ,  $\phi = 0$  deg

$$M_{\infty} = 1.2$$

$$\phi = 90^{\circ}$$

N - NOSE MOUNT

S - SIDE MOUNT

□ - TAPE 5

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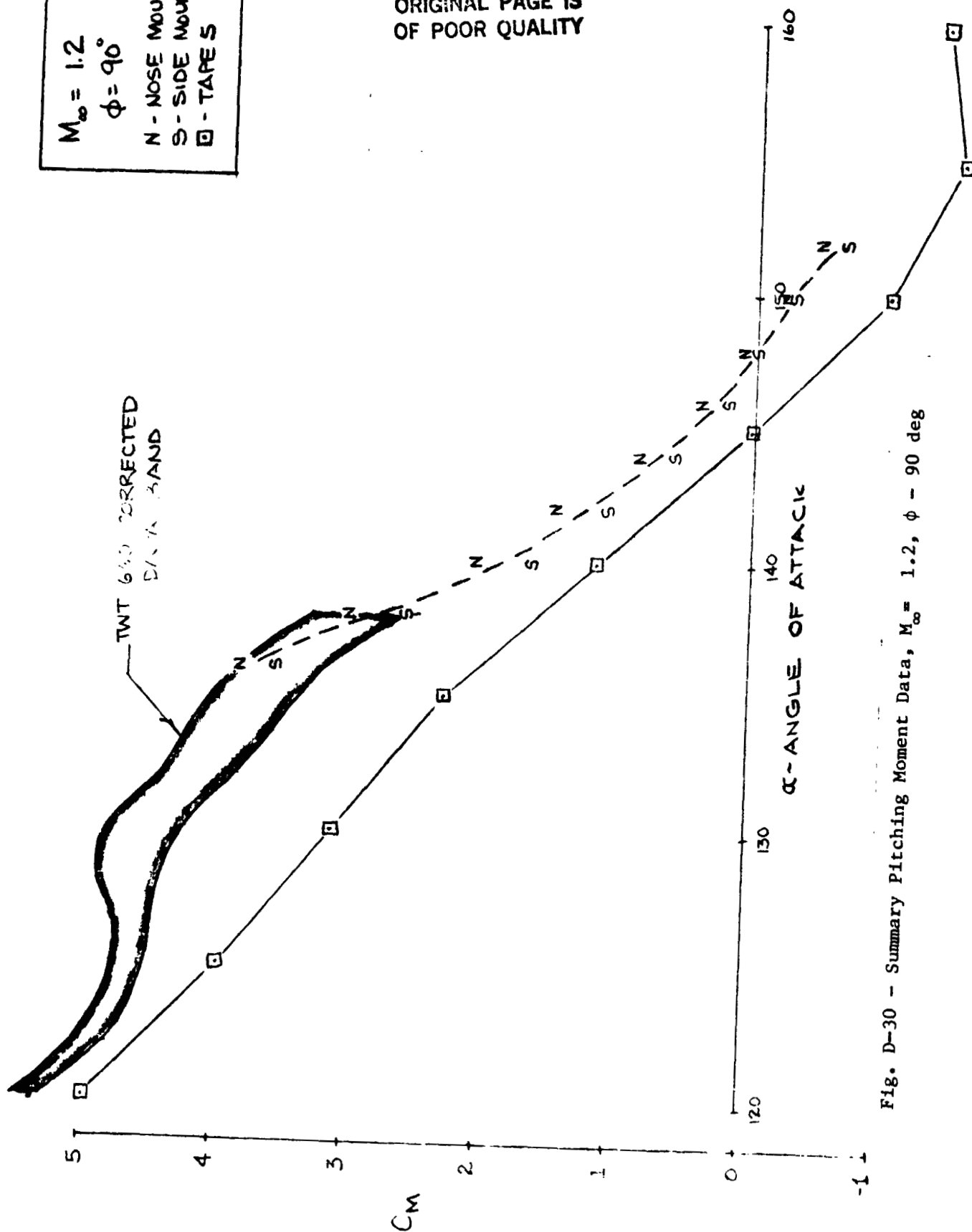


Fig. D-30 - Summary Pitching Moment Data,  $M_{\infty} = 1.2$ ,  $\phi = 90^{\circ}$



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$$M_{\infty} = 0.4$$

$$\phi = 0^{\circ}$$

SYM. CONFIGURATION

$\Delta$  HSS00B

$\circ$  HSDNSB

$\square$  HOONSB

X CORRECTED DATA

---  $R_N = 5 \times 10^6$

---  $R_N = 9.5 \times 10^6$

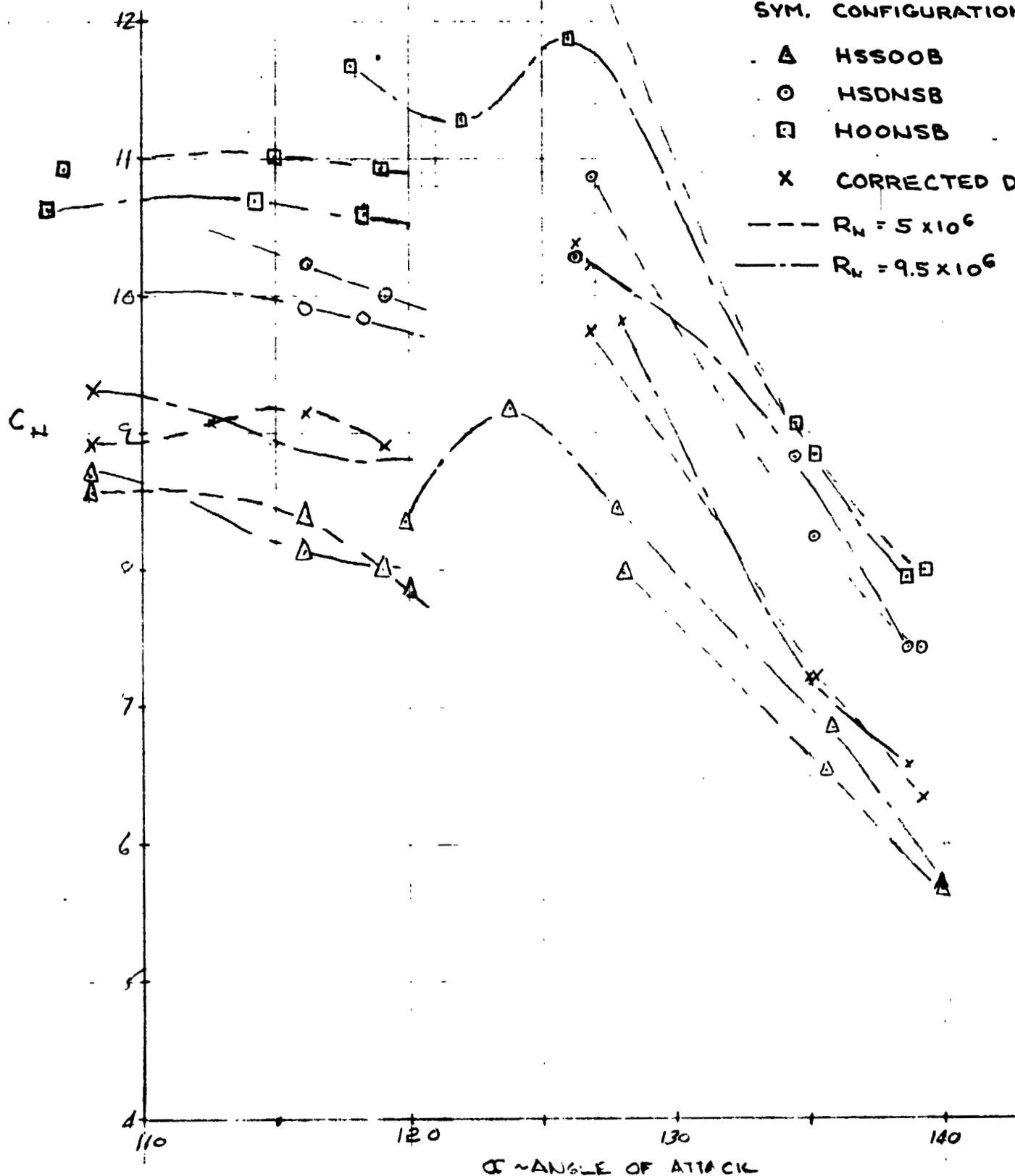


Fig. D-31 - Normal Force Data, HRWT Side Mount,  $M_{\infty} = 0.4$ ,  $\phi = 0$  deg

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$$M_{\infty} = 0.4$$

$$\phi = 90^\circ$$

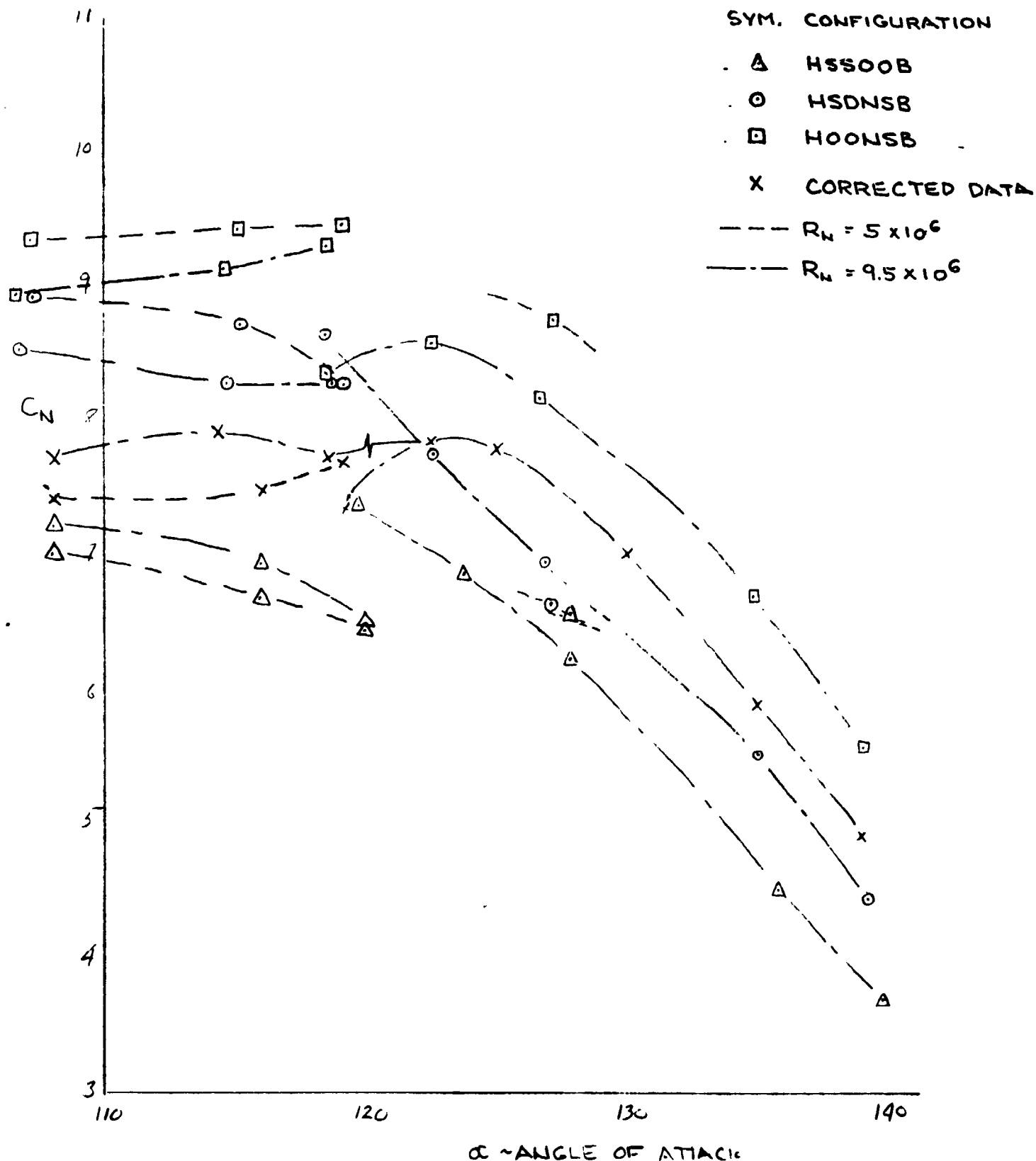


Fig. D-32 - Normal Force Data, HRWT Side Mount,  $M_{\infty} = 0.4$ ,  $\phi = 90$  deg

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$$M_{\infty} = 0.4$$

$$\phi = 0^{\circ}$$

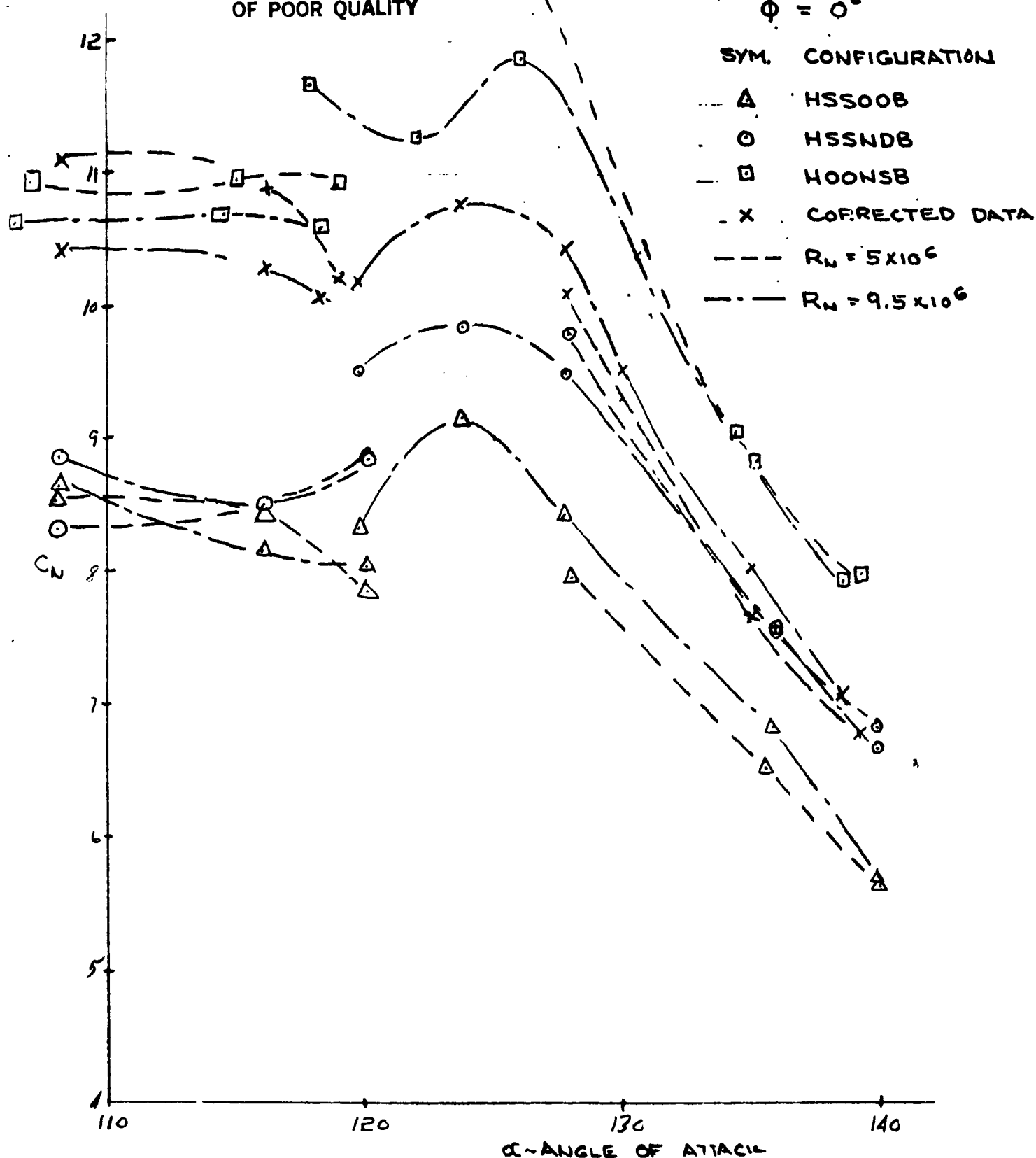


Fig. D-33 - Normal Force Data, HRWT Nose Mount,  $M_{\infty} = 0.4$ ,  $\phi = 0$  deg

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$$M_{\infty} = 0.4$$

$$\phi = 90^\circ$$

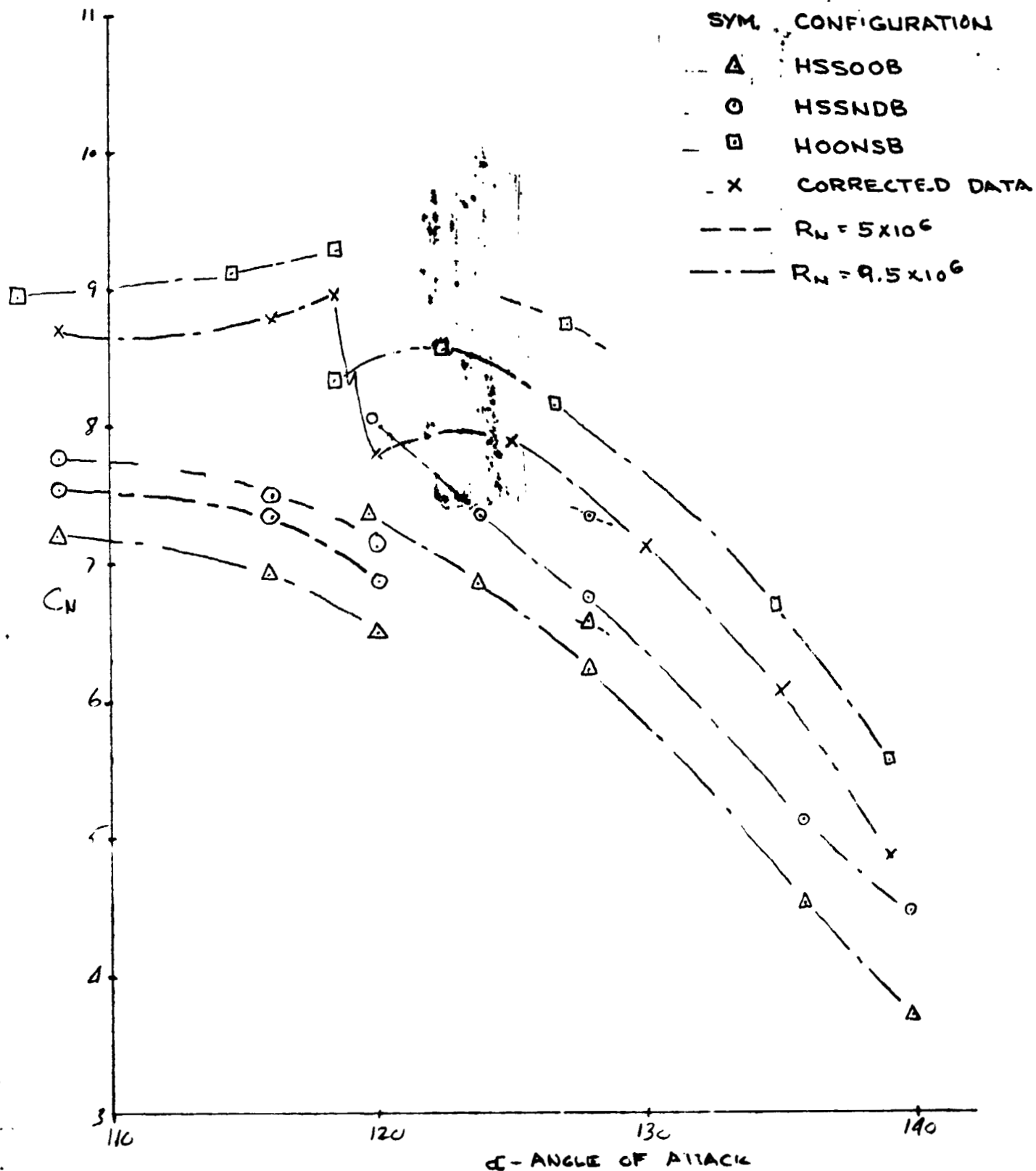


Fig. D-34 - Normal Force Data, HRWT Nose Mount,  $M_{\infty} = 0.4$ ,  $\phi = 90$  deg

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$$M_{\infty} = 0.6$$

$$\phi = 0^{\circ}$$

SYM. CONFIGURATION

$\Delta$  HSS00B

$\circ$  HSDNSB

$\square$  HOONSB

$\times$  CORRECTED DATA

---  $R_N = 5 \times 10^6$

---  $R_N = 9.5 \times 10^6$

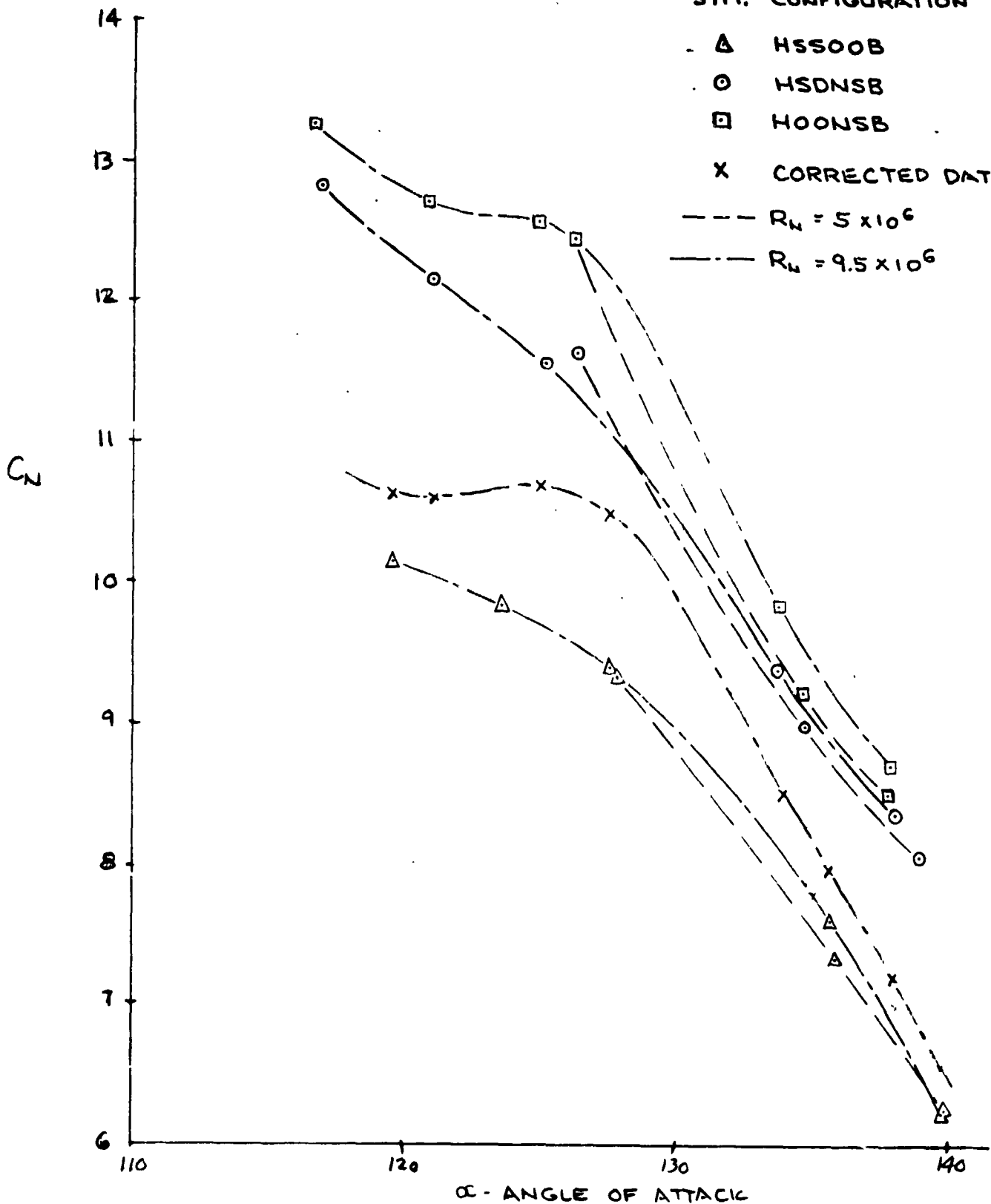


Fig. D-35 - Normal Force Data, HRWT Side Mount,  $M_{\infty} = 0.6$ ,  $\phi = 0^{\circ}$

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$$M_{\infty} = 0.6$$

$$\phi = 90^\circ$$

SYM. CONFIGURATION

$\Delta$  HSS00B

$\circ$  HSDNSB

$\square$  HOONS

X CORRECTED DATA

---  $R_N = 5 \times 10^6$

-.-  $R_N = 9.5 \times 10^6$

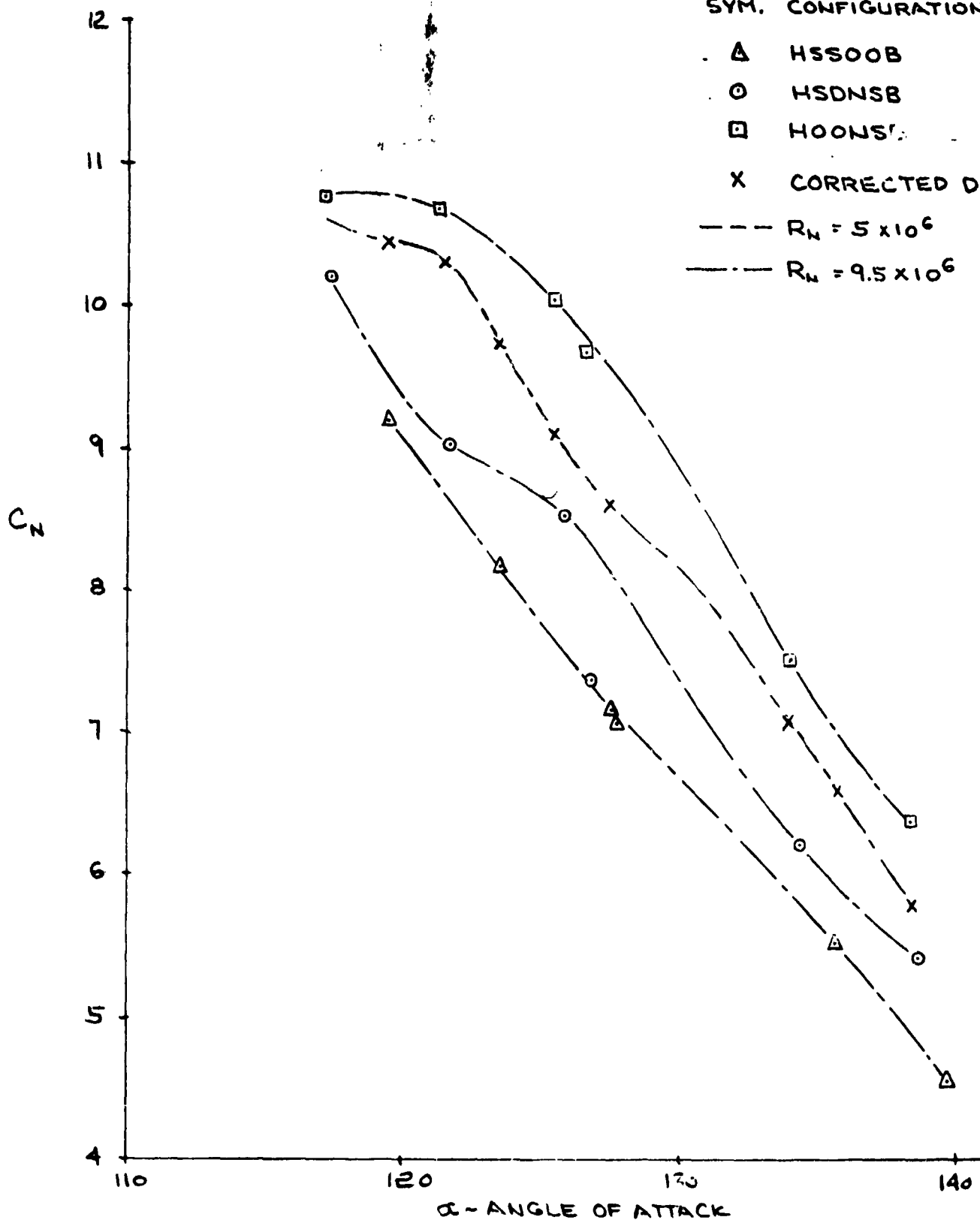


Fig. D-36 - Normal Force Data, HRWT Side Mount,  $M_{\infty} = 0.6$ ,  $\phi = 90^\circ$

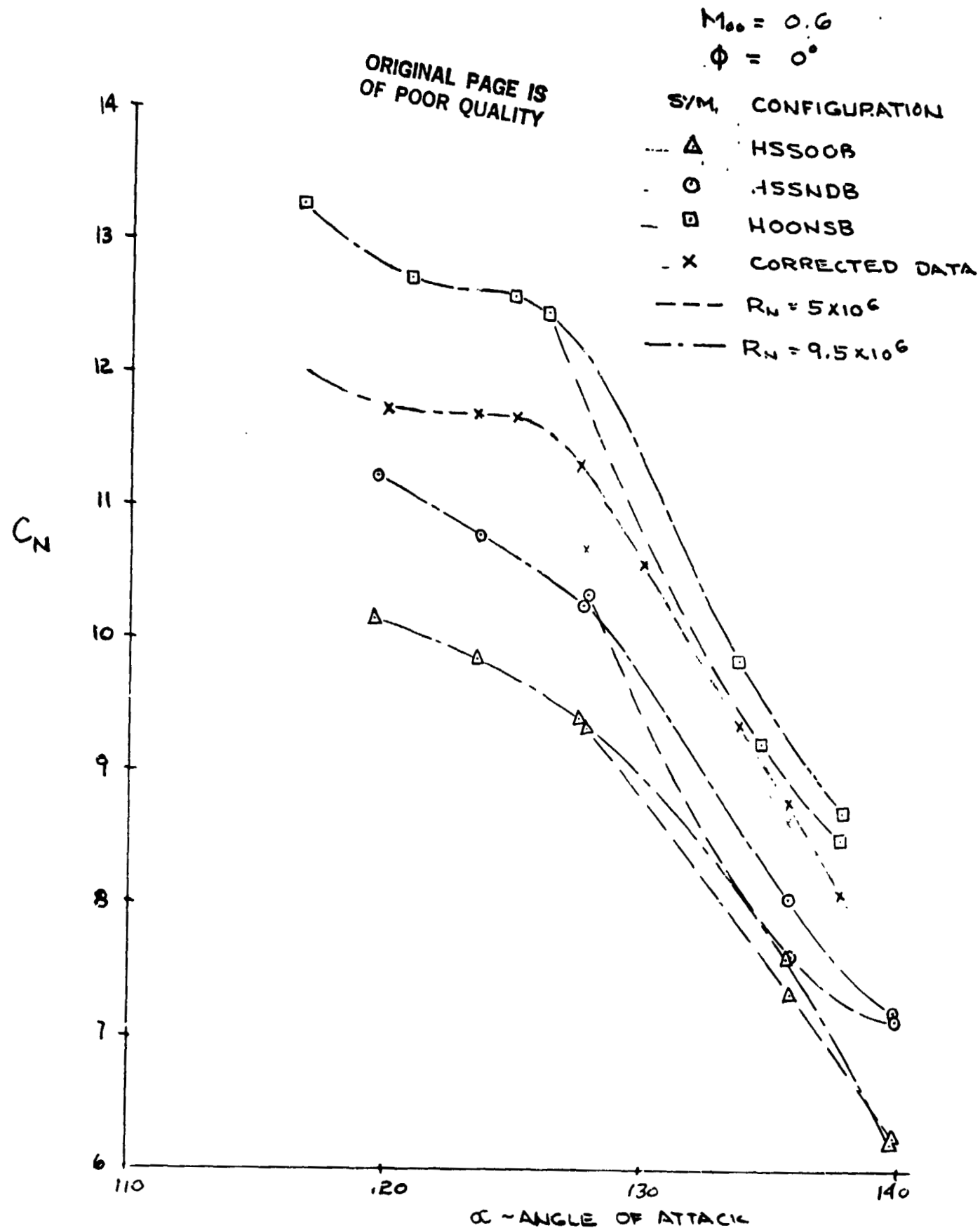


Fig. D-37 - Normal Force Data, HRWT Nose Mount,  $M_{\infty} = 0.6$ ,  $\phi = 0^\circ$

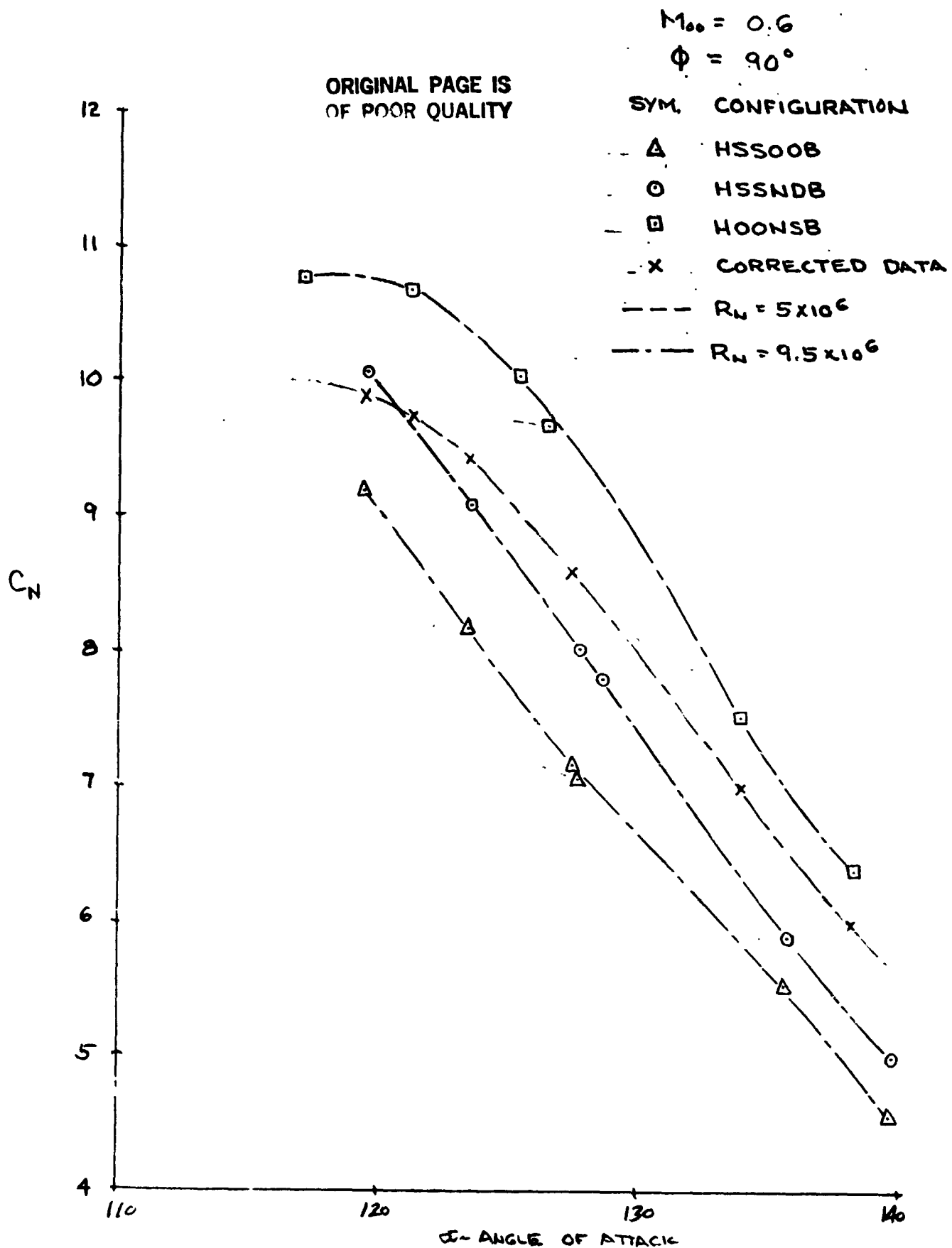


Fig. D-38 - Normal Force Data, HRWT Nose Mount,  $M_{\infty} = 0.6$ ,  $\phi = 90^\circ$



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$$M_{\infty} = 0.8$$

$$\phi = 0^{\circ}$$

SYM. CONFIGURATION

$\Delta$  HSS00B

$\circ$  HSDNSB

$\square$  HOONSB

X CORRECTED DATA

---  $R_N = 5 \times 10^6$

- - -  $R_N = 9.5 \times 10^6$

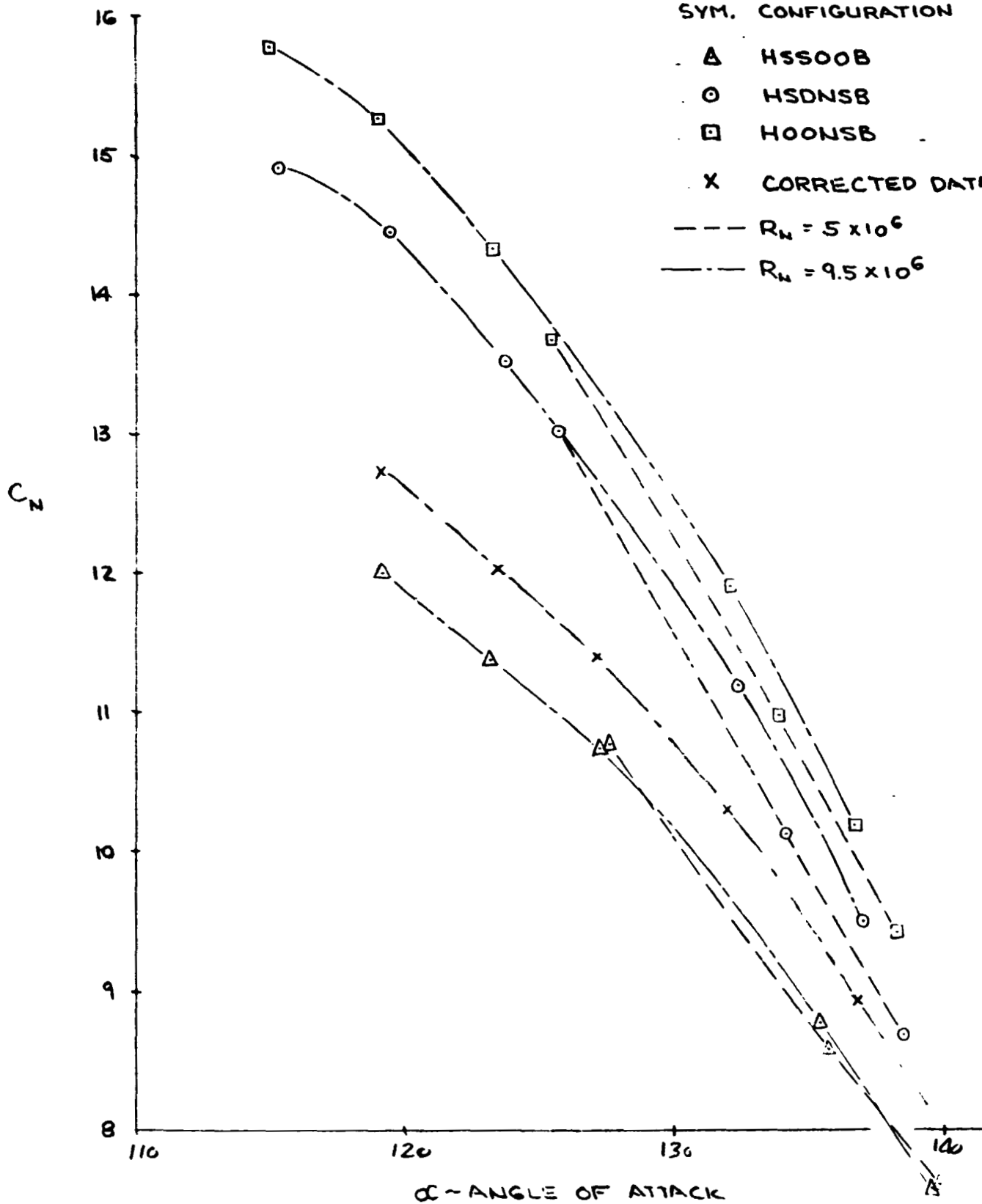


Fig. D-39 - Normal Force Data, HRWT Side Mount,  $M_{\infty} = 0.8$ ,  $\phi = 0^{\circ}$

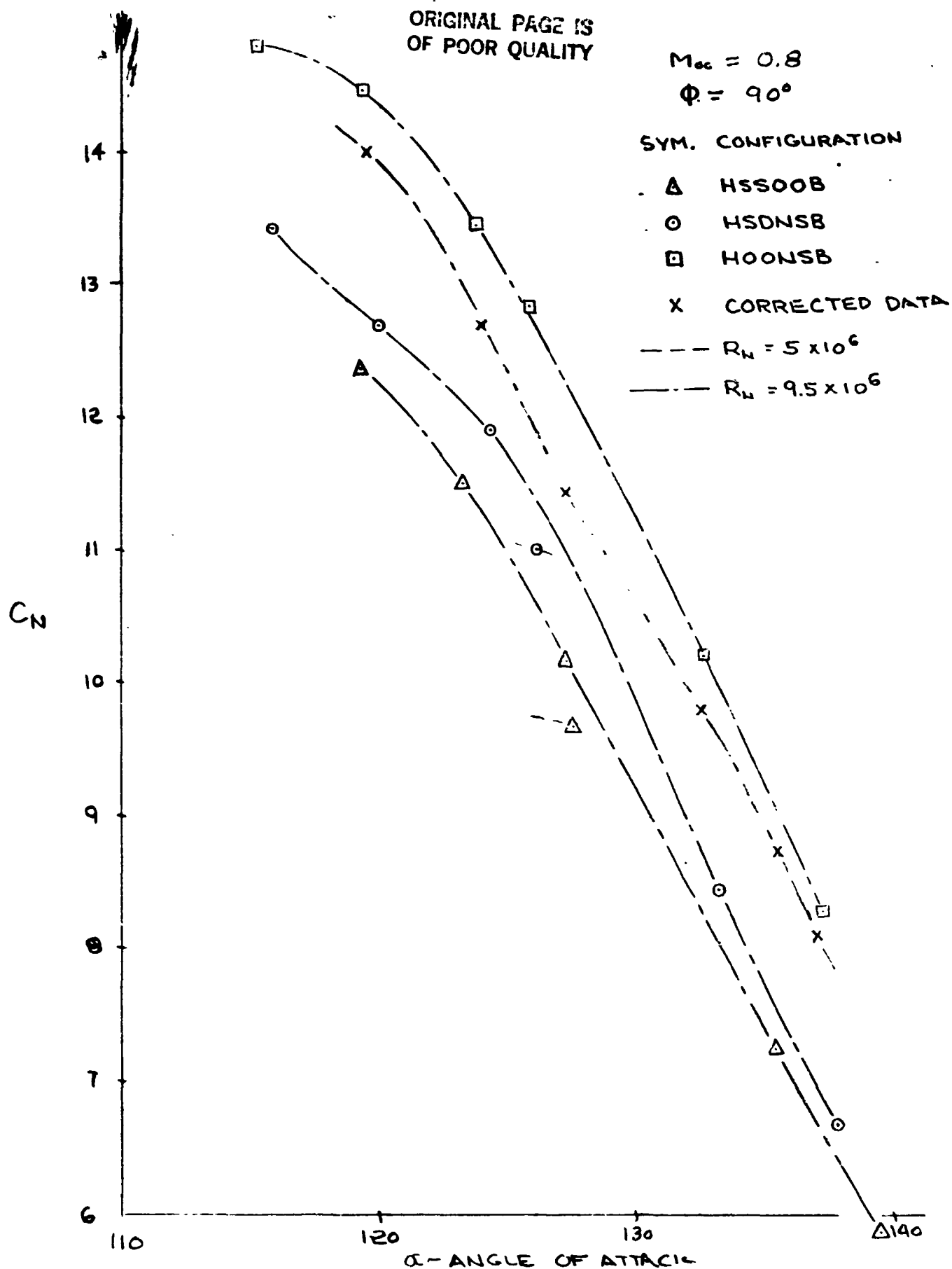


Fig. D-40 - Normal Force Data, HRWT Side Mount,  $M_{ac} = 0.8$ ,  $\phi = 90^\circ$

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$$M_{\infty} = 0.8$$

$$\phi = 0^\circ$$

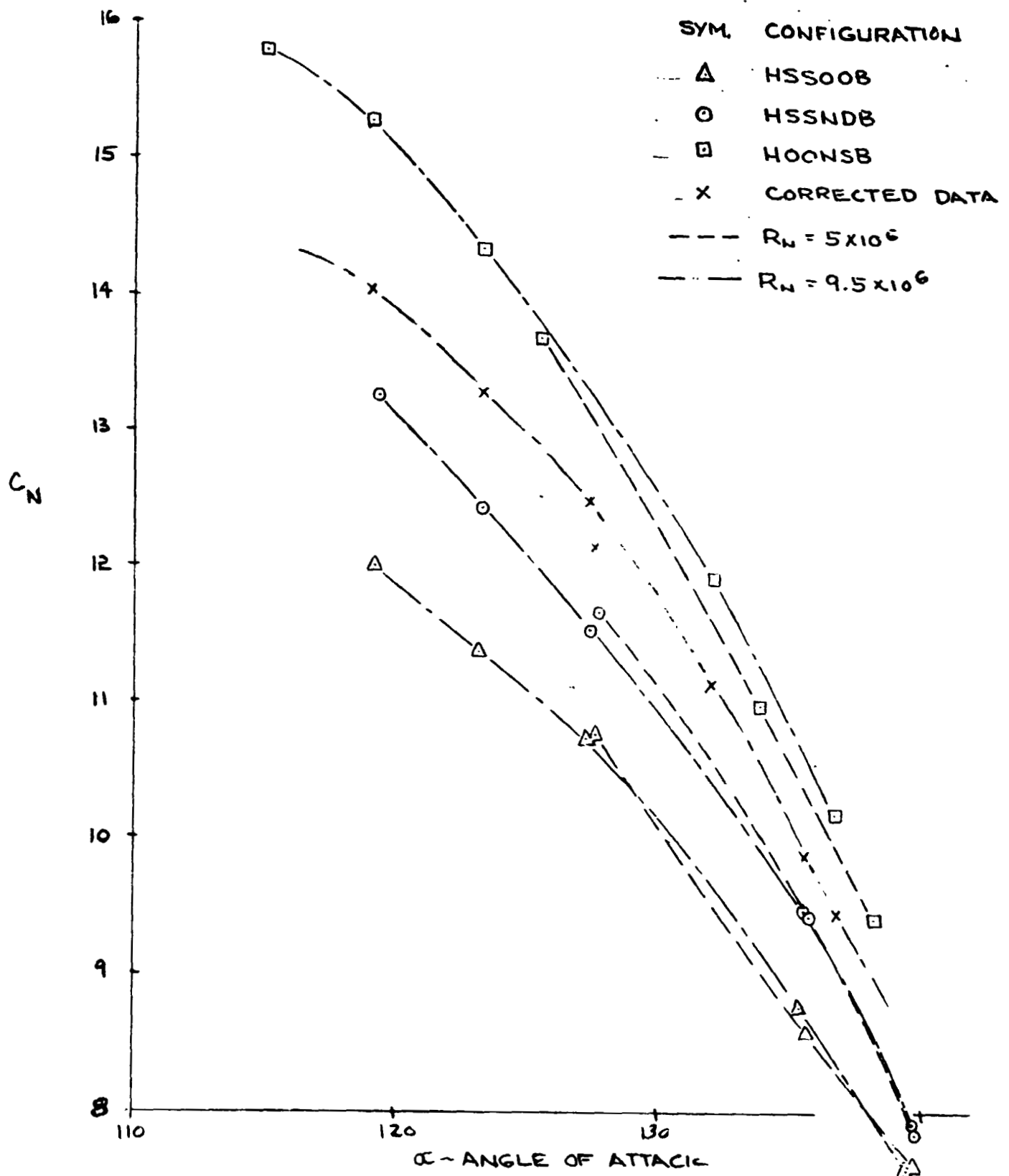


Fig. D-41 - Normal Force Data, HRWT Nose Mount,  $M_{\infty} = 0.8$ ,  $\phi = 0^\circ$

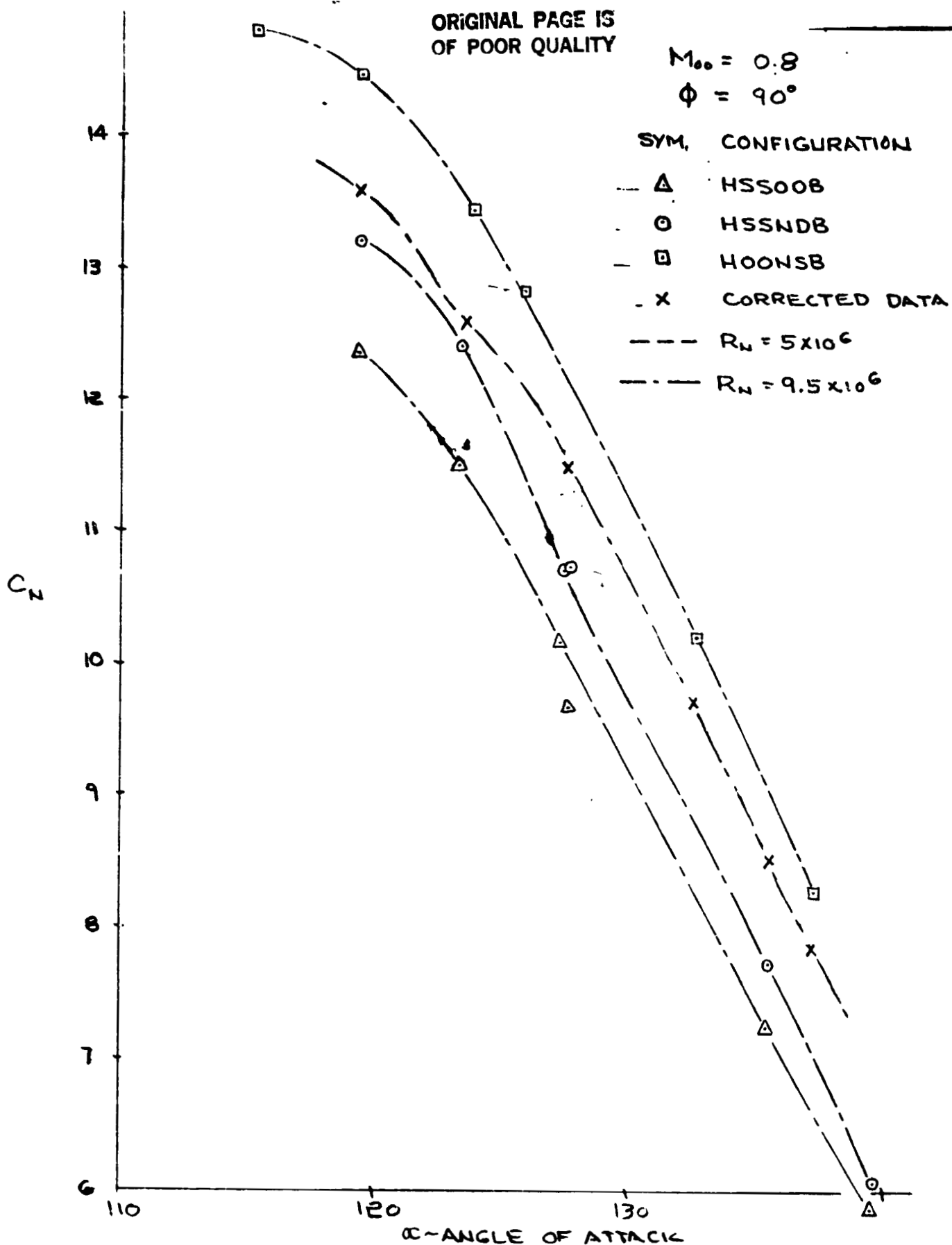


Fig. D-42 - Normal Force Data, HRWT Nose Mount,  $M_{\infty} = 0.8$ ,  $\phi = 90^\circ$

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$M_{\infty} = 0.4$   
 $\phi = 0$

SYM CONFIG.  
□ - TAPE 5  
N - NOSE MOUNT  
S - SIDE MOUNT  
---  $R_N = 5 \times 10^6$   
- - -  $R_N = 9.5 \times 10^6$

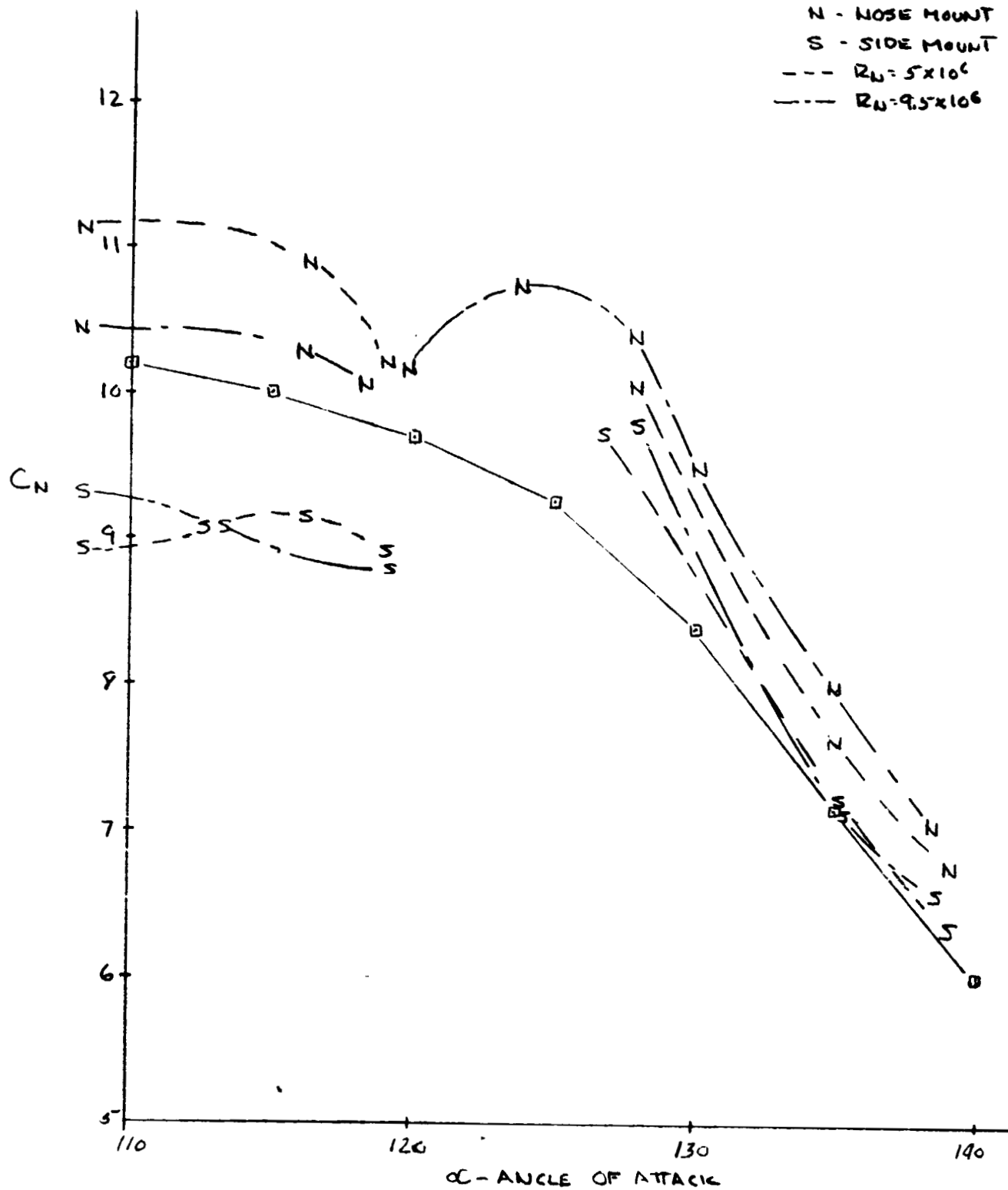


Fig. D-43 - Summary Corrected Normal Force Data,  $M_{\infty} = 0.4$ ,  $\phi = 0$  deg

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$M_\infty = 0.4$   
 $\phi = 90^\circ$

SYM. CONFIG.  
□ - TAPE S  
N - NOSE MOUNT  
S - SIDE MOUNT  
---  $R_N = 5 \times 10^6$   
- - -  $R_N = 9.5 \times 10^6$

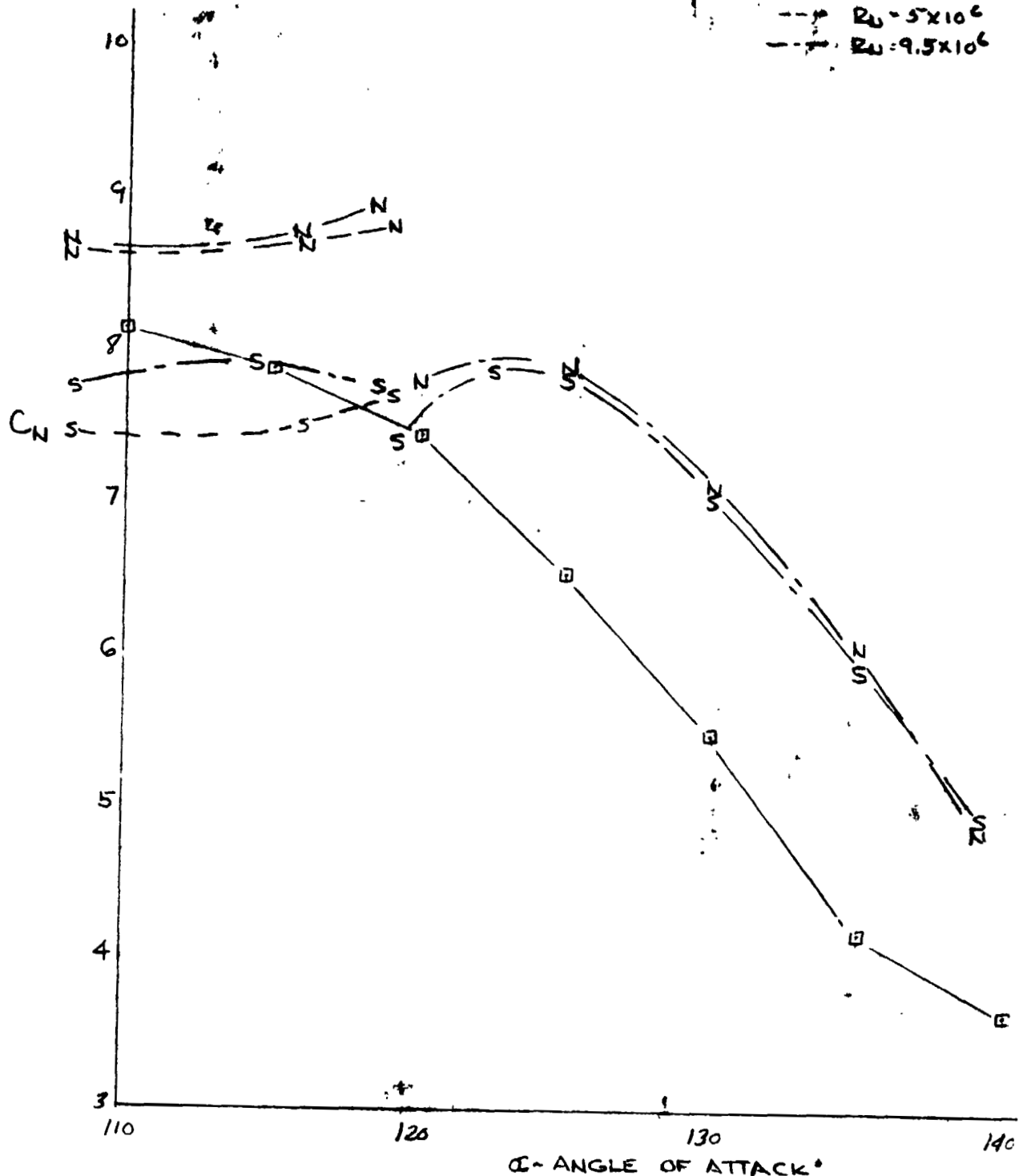


Fig. D-44 - Summary Corrected Normal Force Data,  $M_\infty = 0.4$ ,  $\phi = 90$  deg

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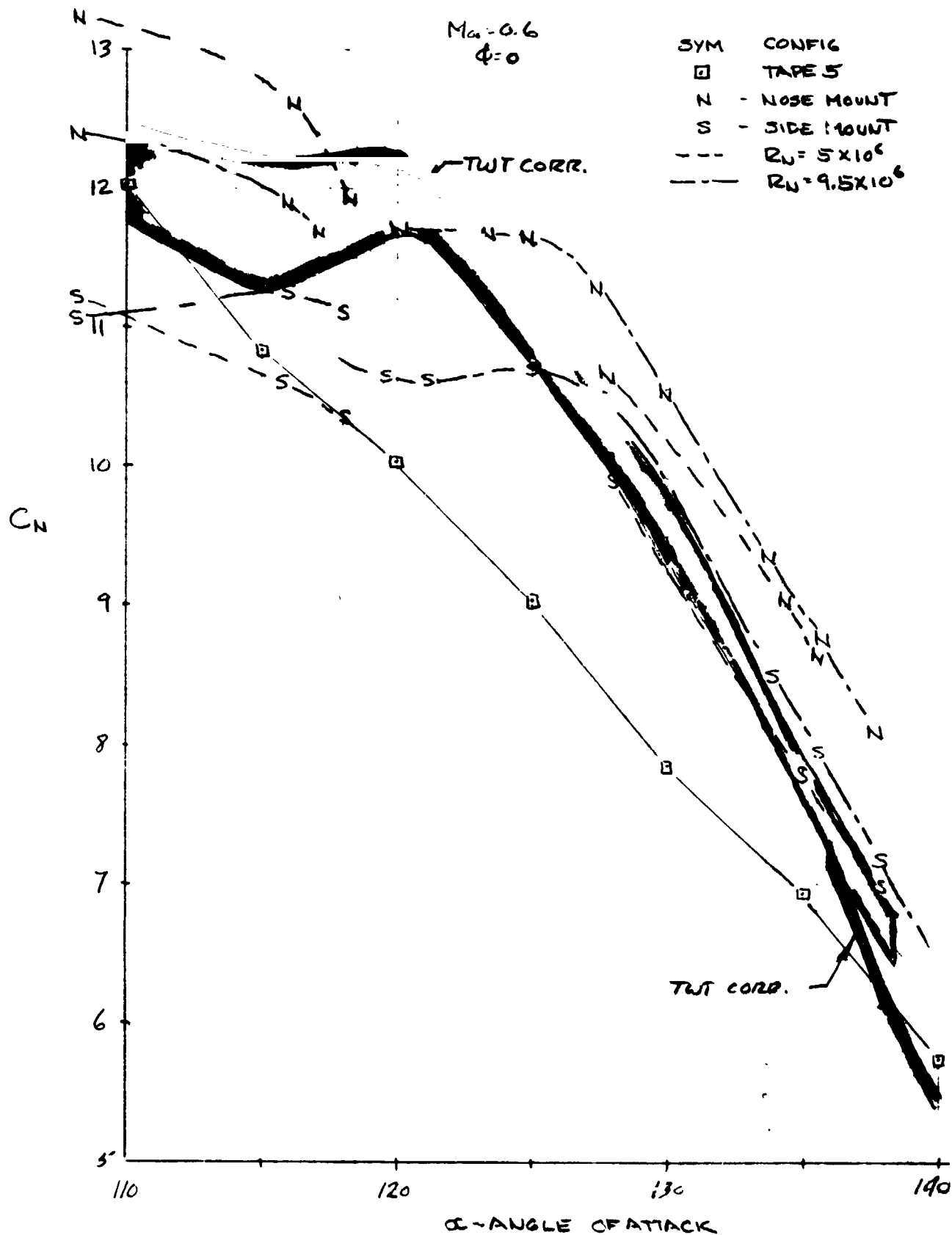


Fig. D-45 - Summary Corrected Normal Force Data,  $M_\infty = 0.6$ ,  $\phi = 0$  deg

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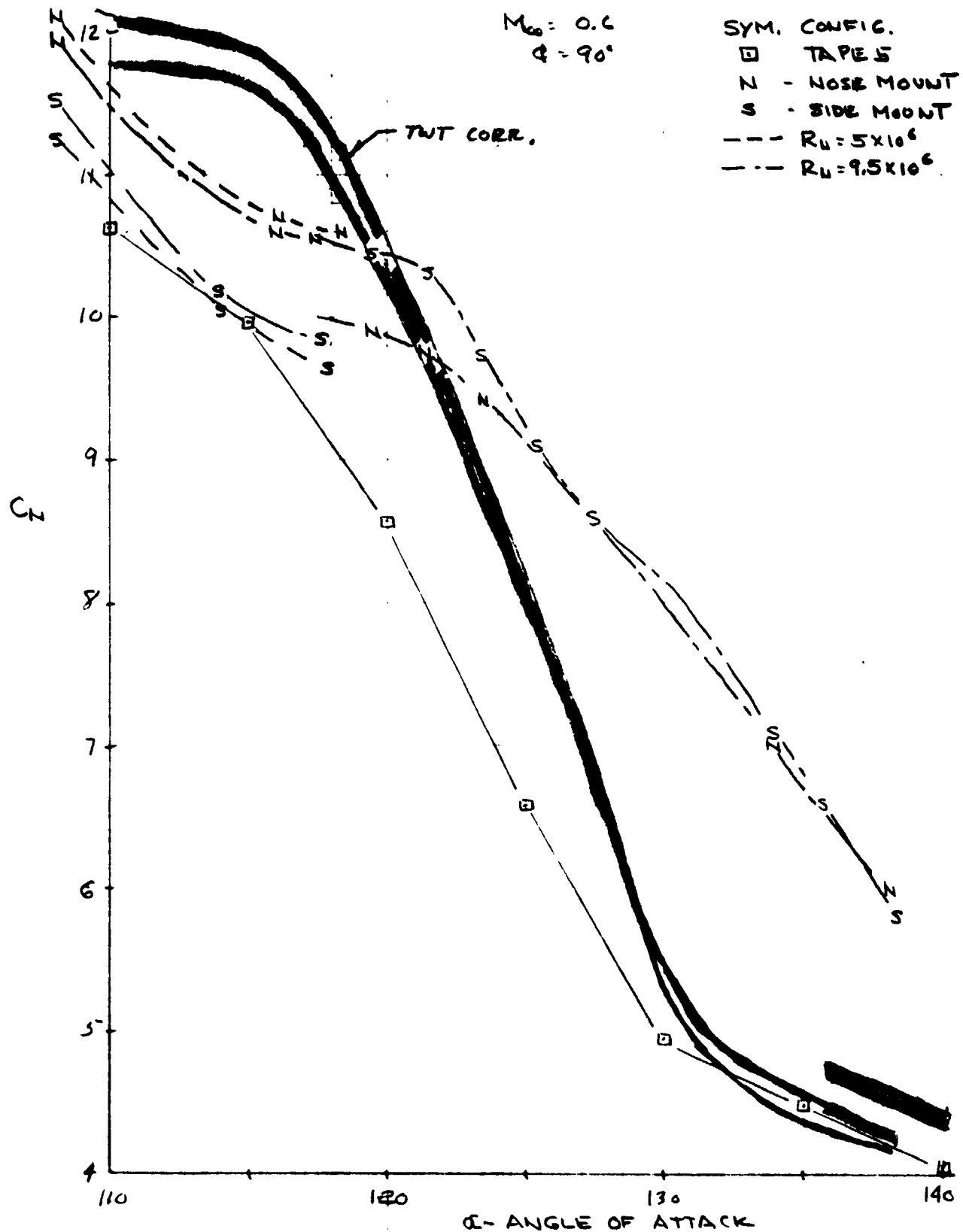


Fig. D-46 - Summary Corrected Normal Force Data,  $M_{\infty} = 0.6$ ,  $\phi = 90^\circ$



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$M_\infty = 0.8$   
 $\phi = 0$

SYM. CONFIG.  
□ - TAPES  
N - NOSE MOUNT  
S - SIDE MOUNT  
---  $R_N = 5 \times 10^6$   
- - -  $R_N = 9.5 \times 10^6$

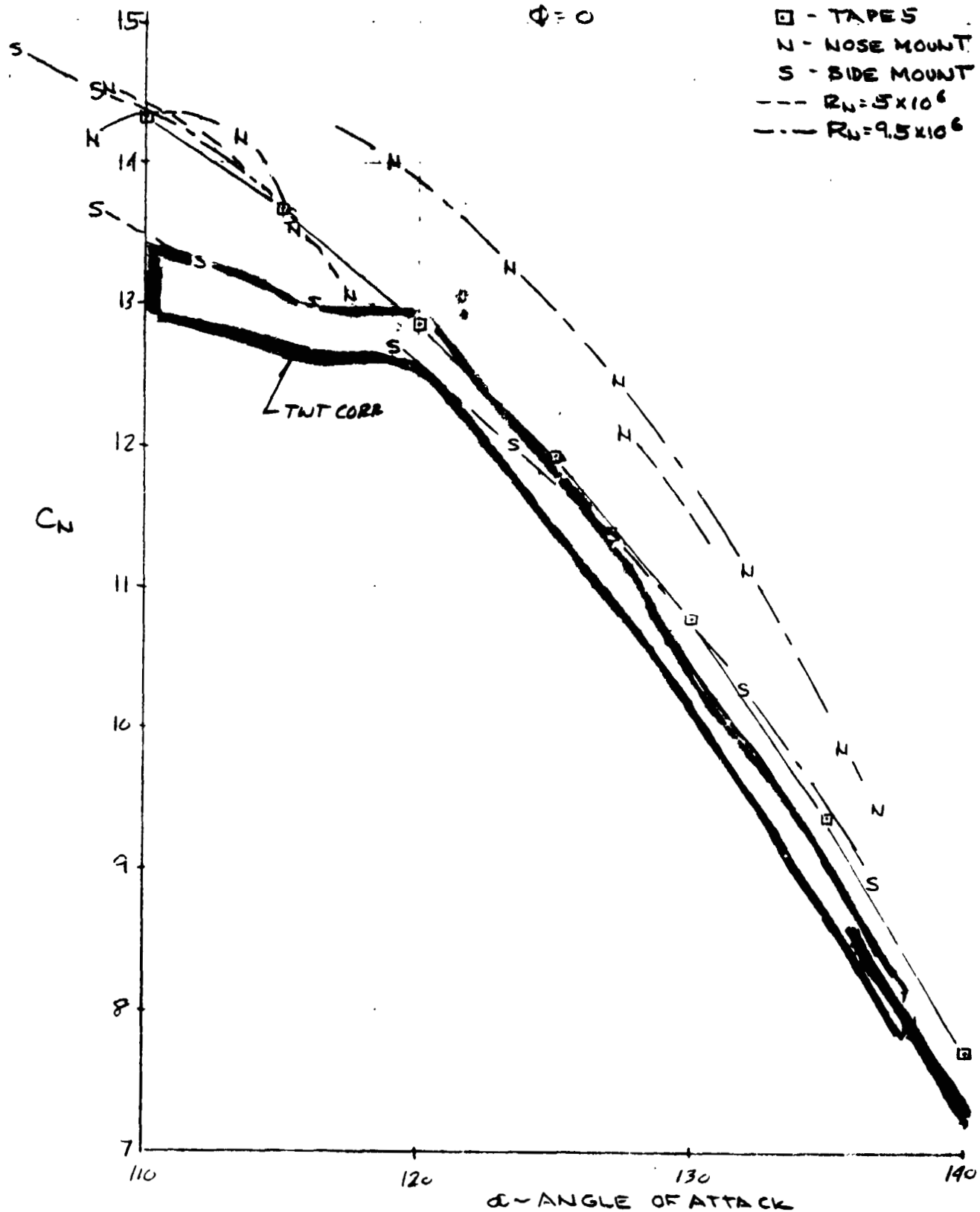


Fig. D-47 - Summary Corrected Normal Force Data,  $M_\infty = 0.8$ ,  $\phi = 0$  deg

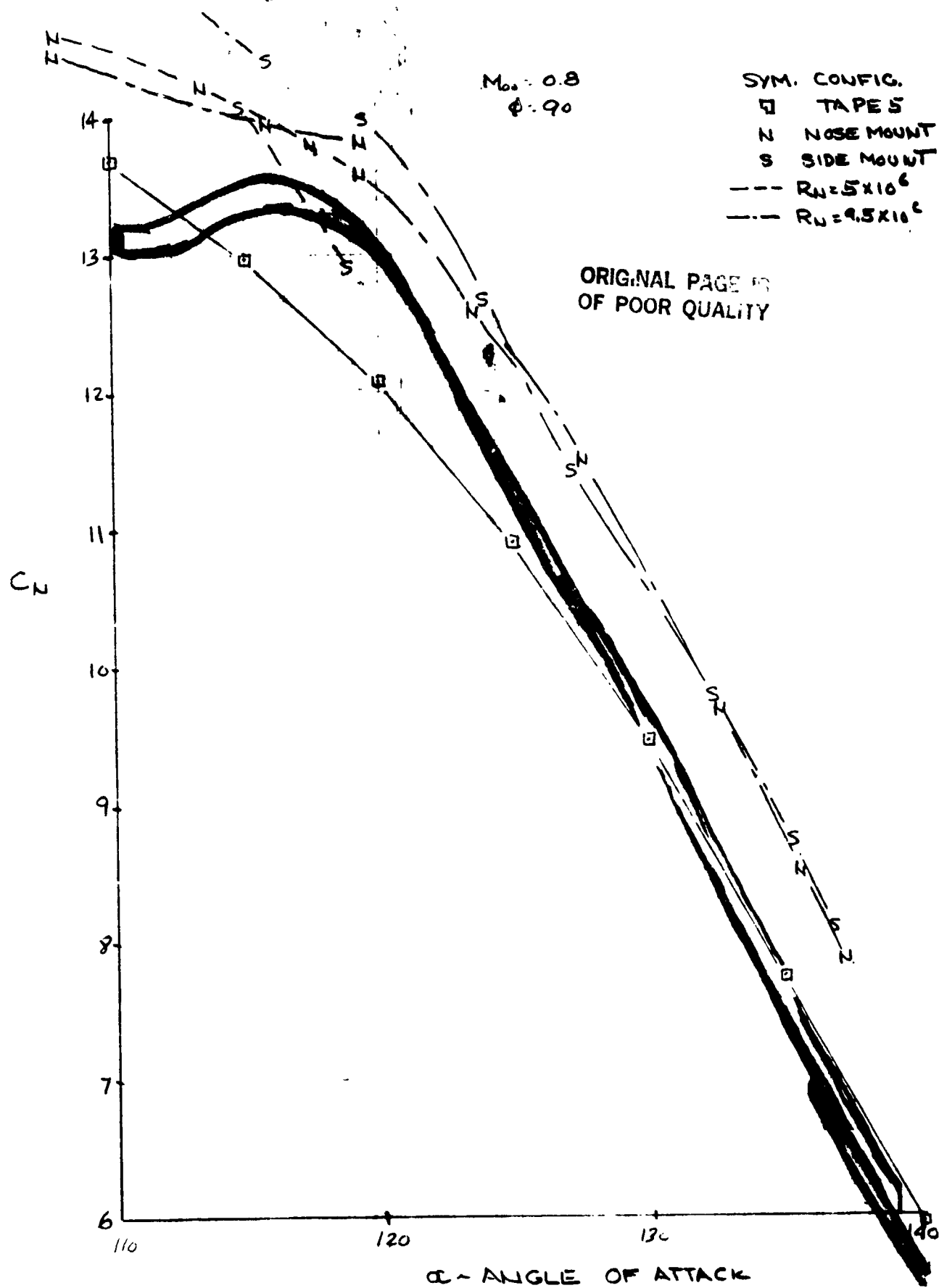


Fig. D-48 - Summary Corrected Normal Force Data,  $M_\infty = 0.8$ ,  $\phi = 90$  deg

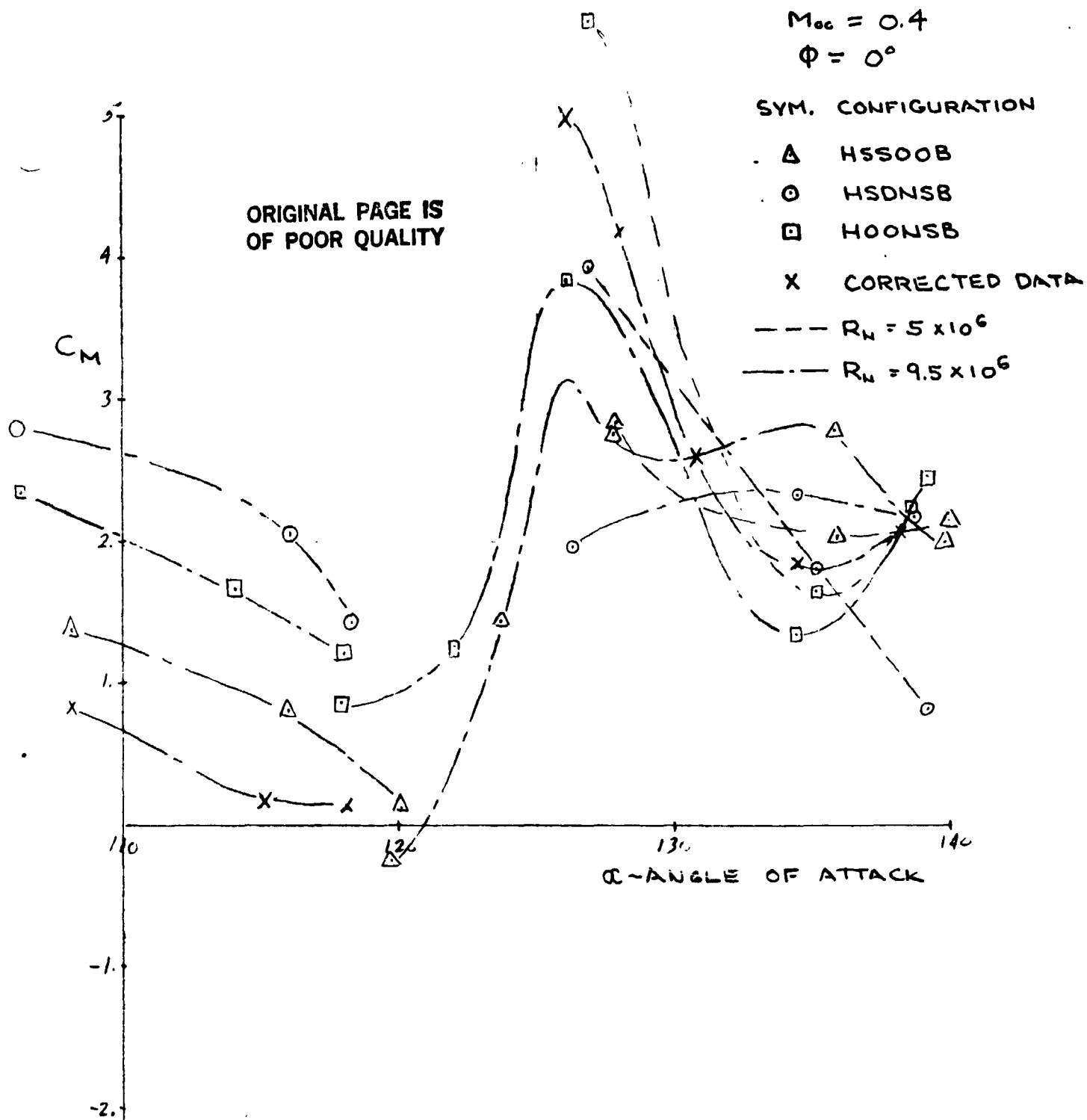


Fig. D-49 - Pitching Moment Data, HRWT Side Mount,  $M_{\infty} = 0.4$ ,  $\phi = 0$  deg

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$$M_{\infty} = 0.4$$

$$\phi = 90^\circ$$

WING CONFIGURATION

$\Delta$  HSS00B

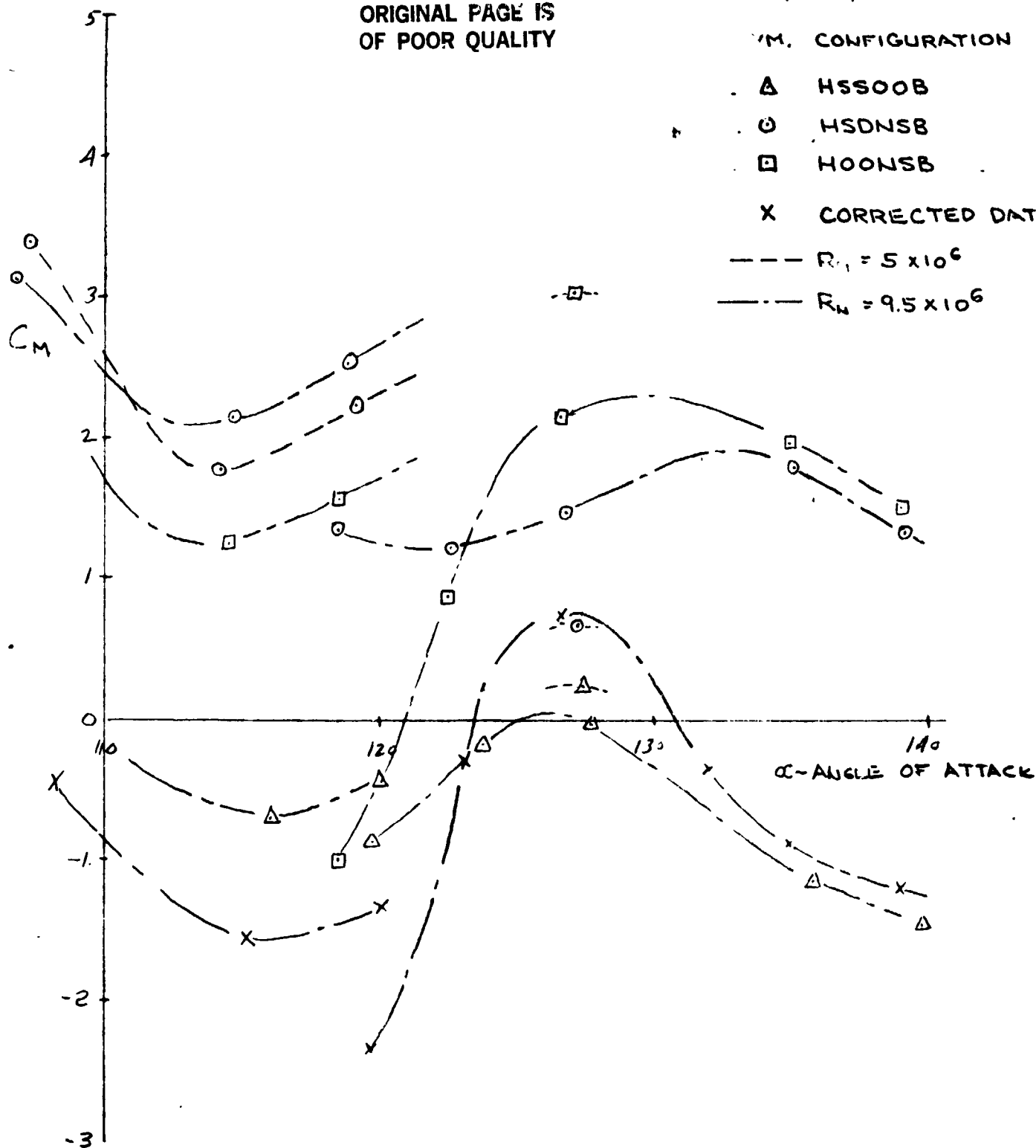
$\circ$  HSDNSB

$\square$  HOONSB

X CORRECTED DATA

---  $R_N = 5 \times 10^6$

—  $R_N = 9.5 \times 10^6$



Fig, D-50 - Pitching Moment Data, HRWT Side Mount,  $M_{\infty} = 0.4$ ,  $\phi = 90$  deg

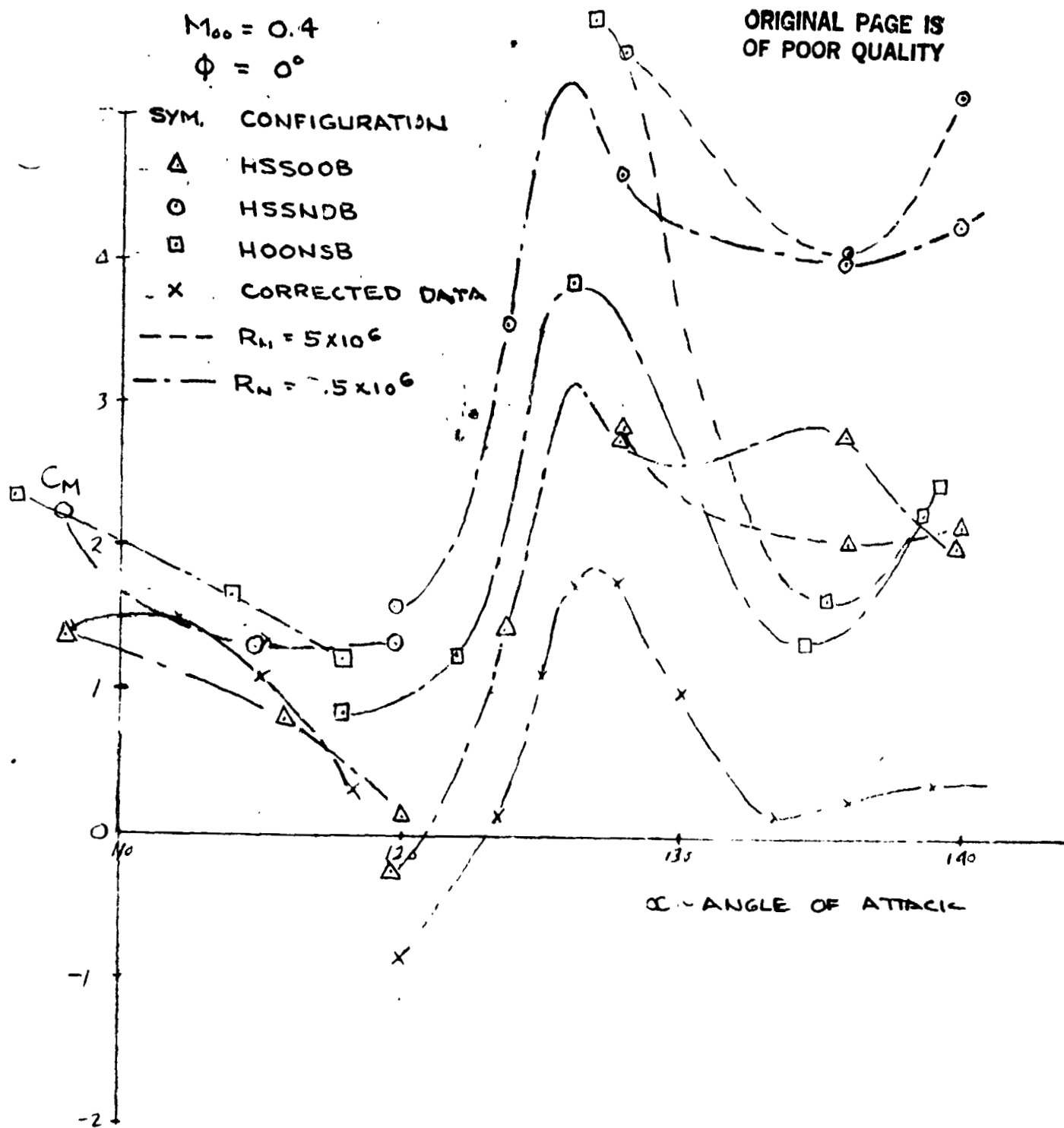


Fig. D-51 - Pitching Moment Data, HRWT Nose Mount,  $M_{\infty} = 0.4$ ,  $\phi = 0$  deg

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$$M_{\infty} = 0.4$$

$$\phi = 90^{\circ}$$

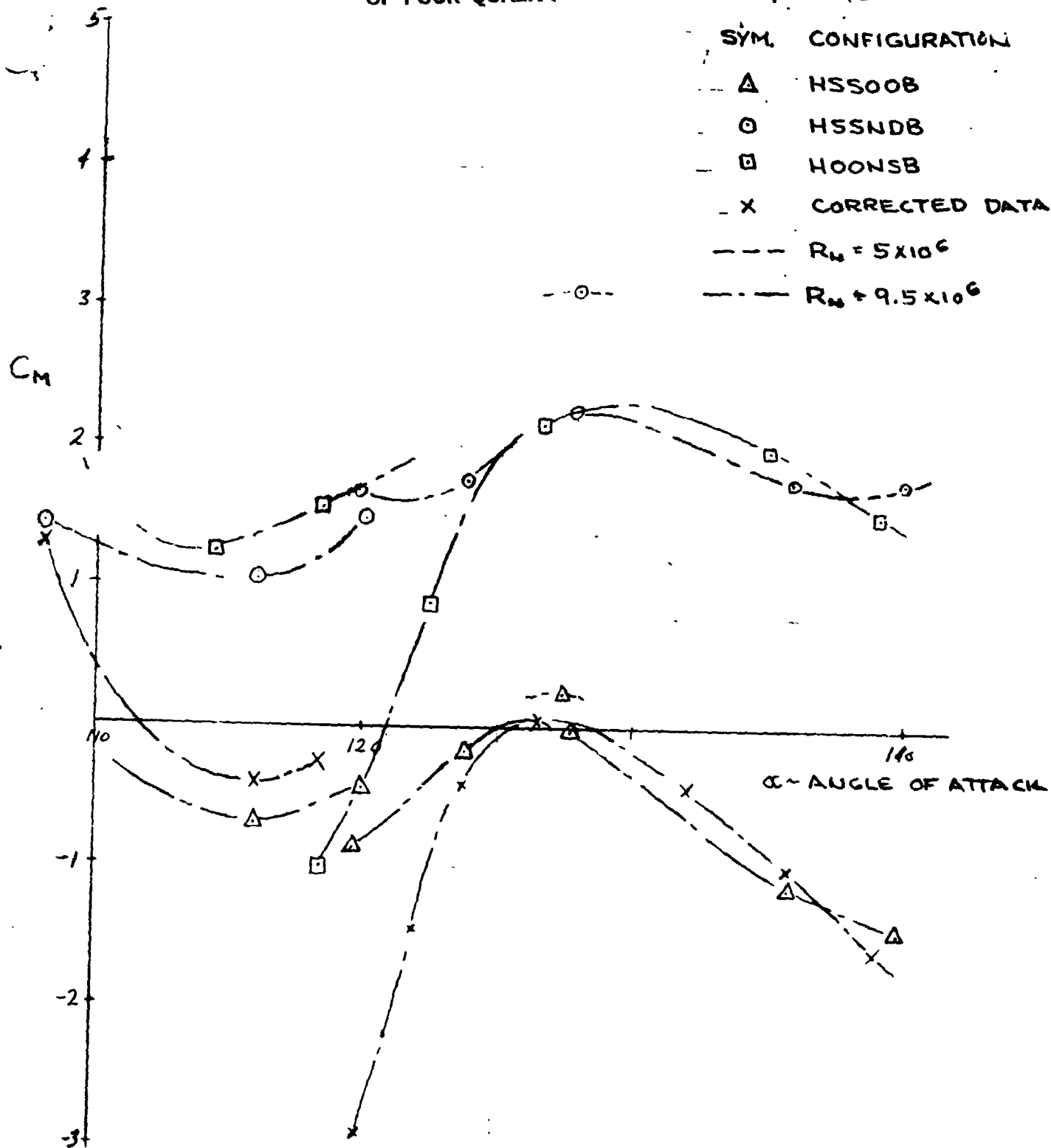


Fig. D-52 - Pitching Moment Data, HRWT Nose Mount,  $M_{\infty} = 0.4$ ,  $\phi = 90^{\circ}$

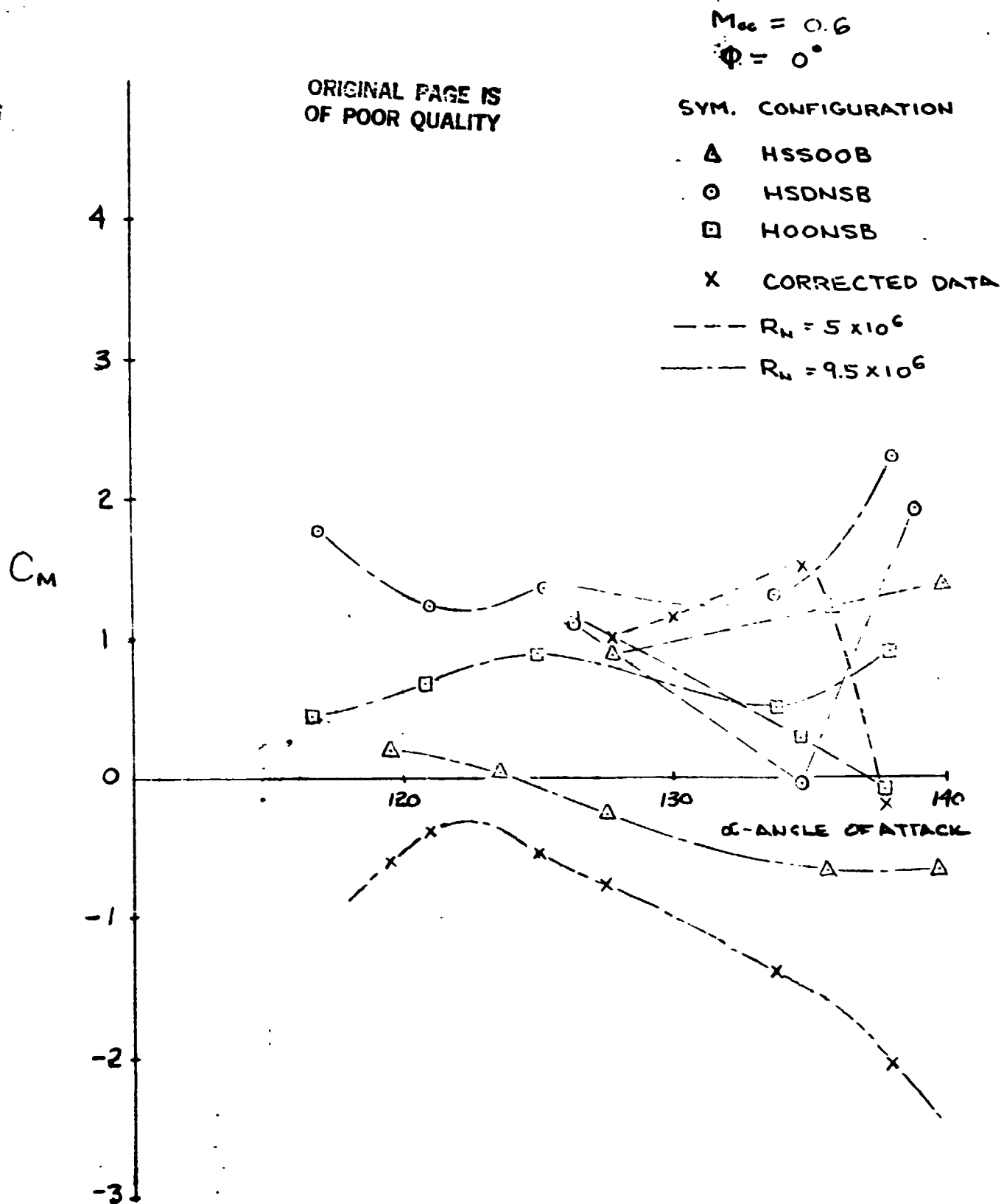


Fig. D-53 - Pitching Moment Data, HRWT Side Mount,  $M_{\infty} = 0.6$ ,  $\phi = 0^\circ$

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$$M_{\infty} = 0.6$$

$$\phi = 90^\circ$$

SYM. CONFIGURATION

$\Delta$  HSS00B

$\circ$  HSDNSB

$\square$  HOONSB

X CORRECTED DATA

---  $R_{\mu} = 5 \times 10^6$

---  $R_{\mu} = 9.5 \times 10^6$

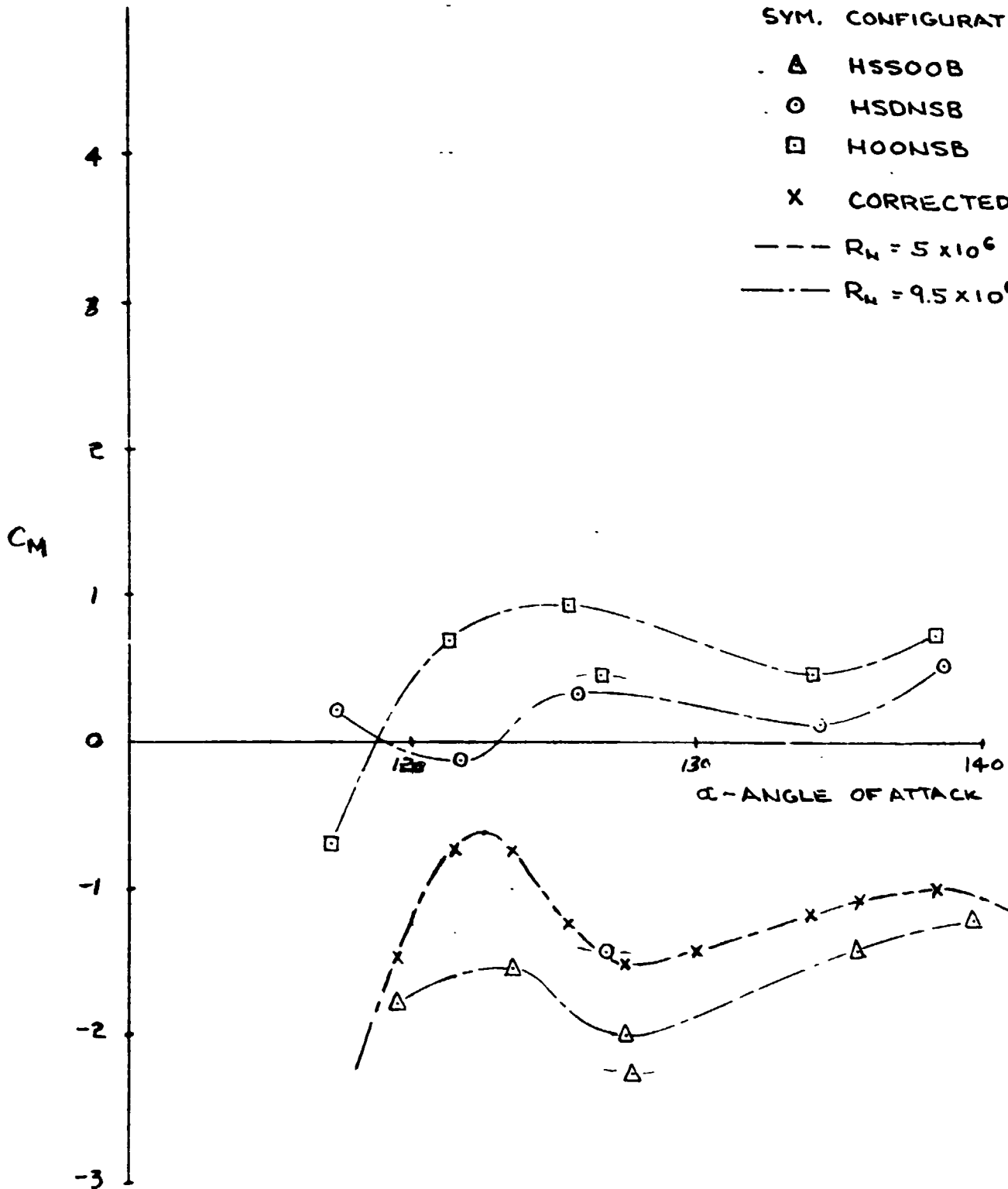


Fig. D-54 - Pitching Moment Data, HRWT Side Mount,  $M_{\infty} = 0.6$ ,  $\phi = 90^\circ$



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$$M_{\infty} = 0.6$$

$$\phi = 0^{\circ}$$

SYM. CONFIGURATION

—  $\Delta$  HSS00B

—  $\circ$  HSSNDB

—  $\square$  HOONSB

— x CORRECTED DATA

---  $R_N = 5 \times 10^6$

-.-  $R_N = 9.5 \times 10^6$

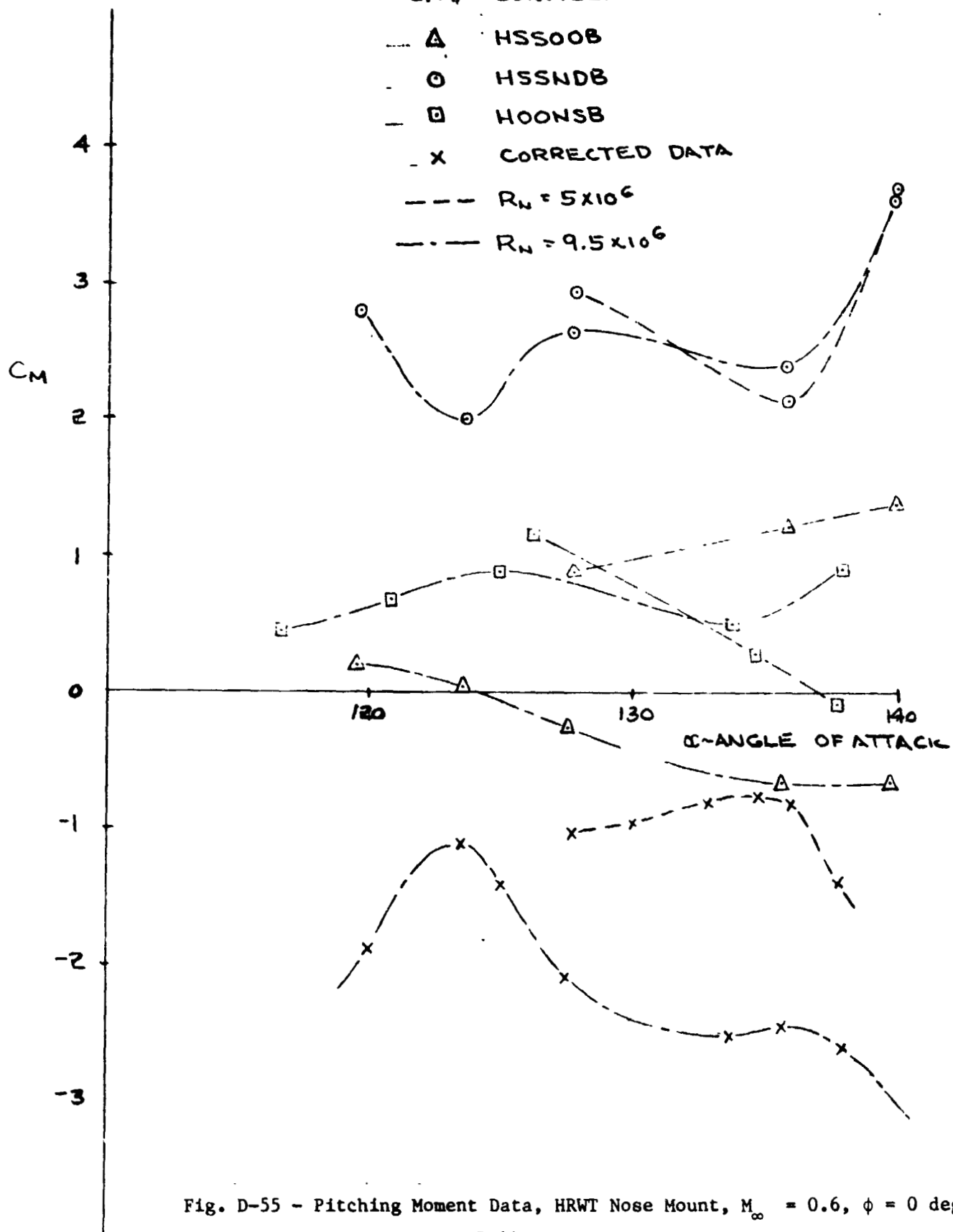


Fig. D-55 - Pitching Moment Data, HRWT Nose Mount,  $M_{\infty} = 0.6$ ,  $\phi = 0$  deg

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$M_{\infty} = 0.6$

$\phi = 90^\circ$

SYM. CONFIGURATION

$\Delta$  HSS00B

$\circ$  HSSNDB

$\square$  HOONSB

$\times$  CORRECTED DATA

---  $R_N = 5 \times 10^6$

- - -  $R_N = 9.5 \times 10^6$

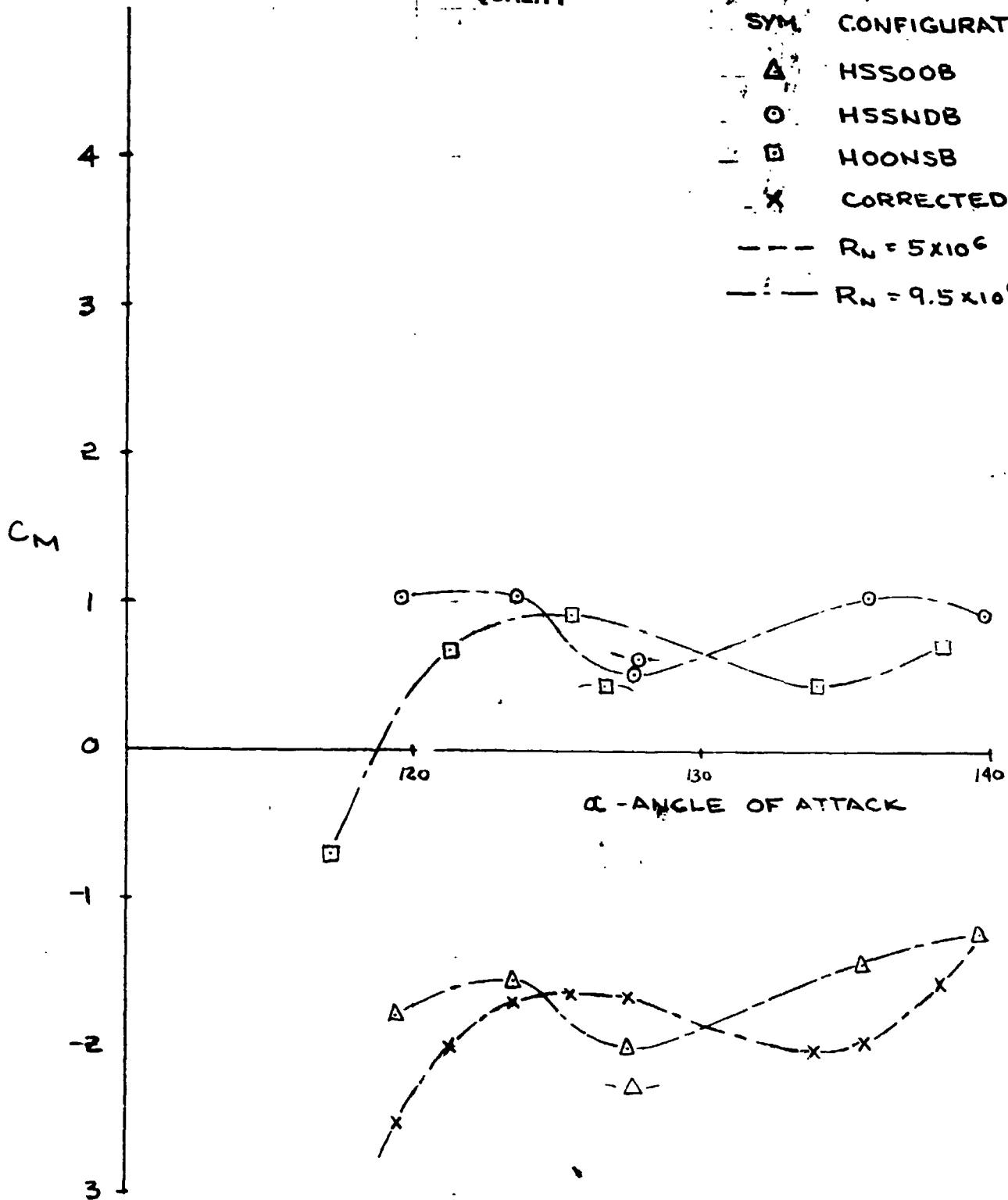


Fig. D-56 - Pitching Moemnt Data, HRWT Nose Mount,  $M_{\infty} = 0.6$ ,  $\phi = 90$  deg.

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$$M_{\infty} = 0.8$$

$$\phi = 0^{\circ}$$

SYM. CONFIGURATION

$\Delta$  HSS00B

$\circ$  HSDNSB

$\square$  HOONSB

X CORRECTED DATA

---  $R_N = 5 \times 10^6$

—  $R_N = 9.5 \times 10^6$

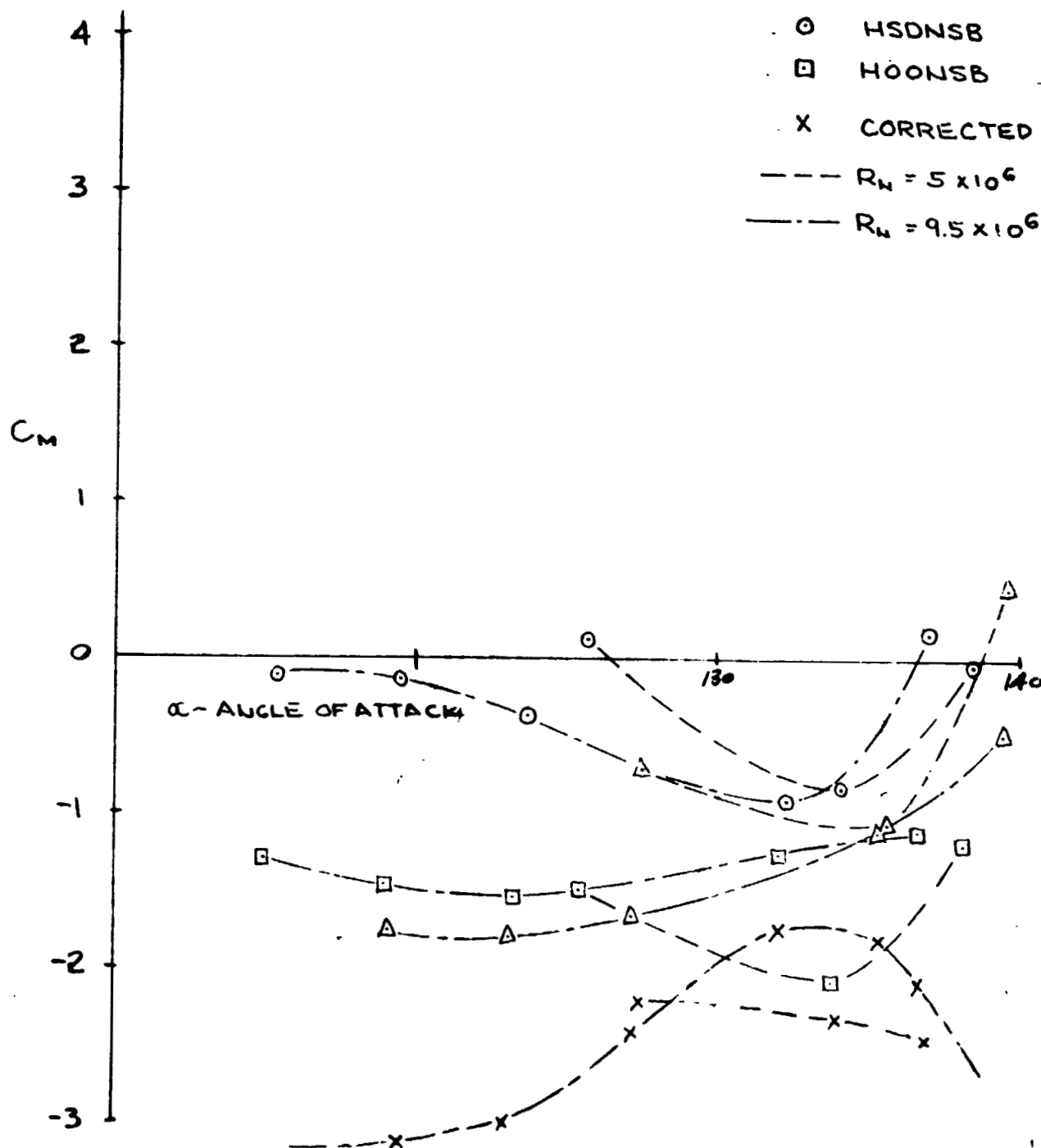


Fig. D-57 - Pitching Moment Data, HRWT Side Mount,  $M_{\infty} = 0.8$ ,  $\phi = 0$  deg

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$$M_{\infty} = 0.8$$

$$\phi = 90^{\circ}$$

SYM. CONFIGURATION

$\Delta$  HSS00B

$\circ$  HSDNSR

$\square$  HCONSB

X CORRECTED DATA

---  $R_N = 5 \times 10^6$

— · —  $R_N = 9.5 \times 10^6$

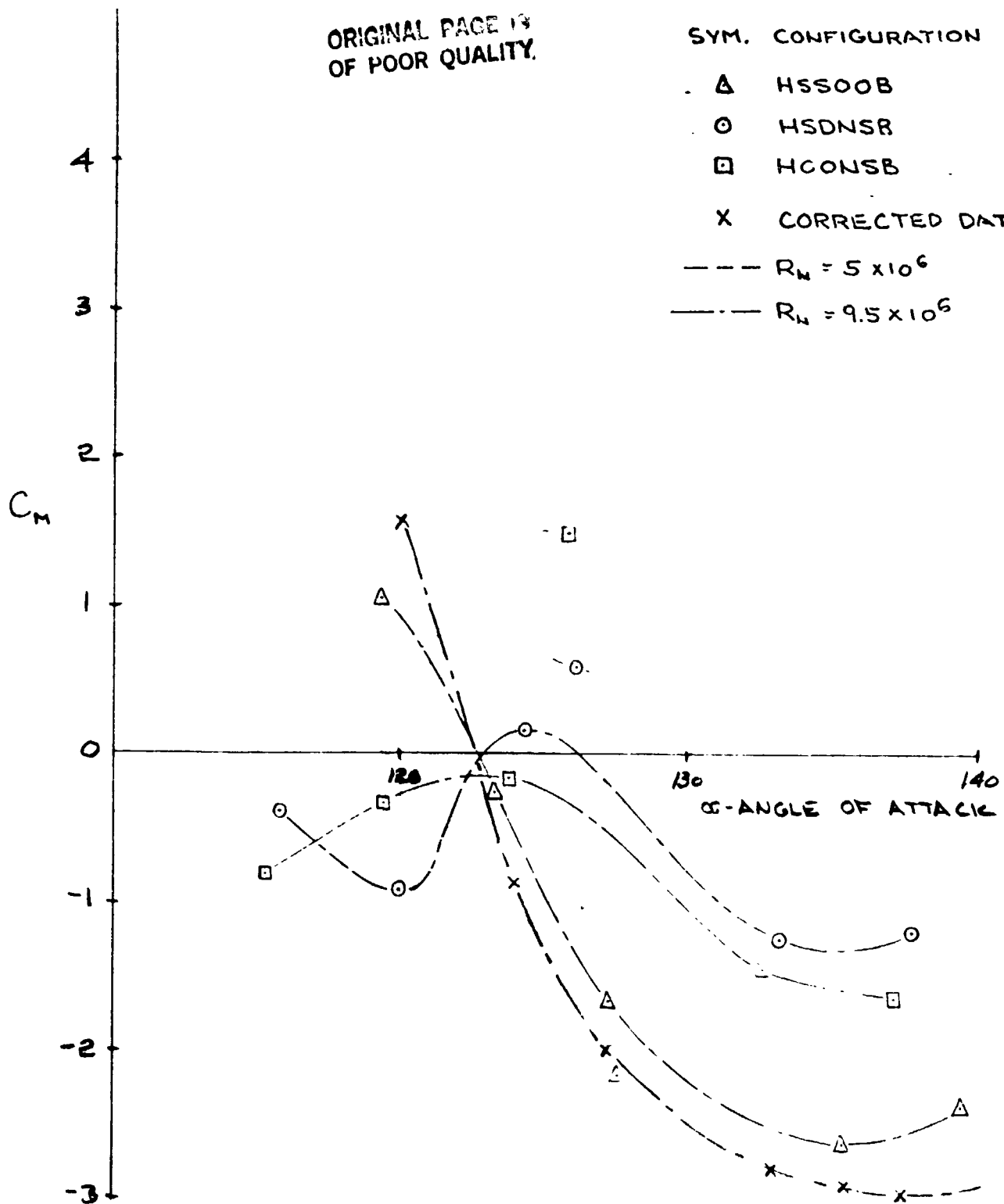


Fig. D-58 - Pitching Moment Data, HRWT Side Mount.  $M_{\infty} = 0.8$ ,  $\phi = 90^{\circ}$  deg

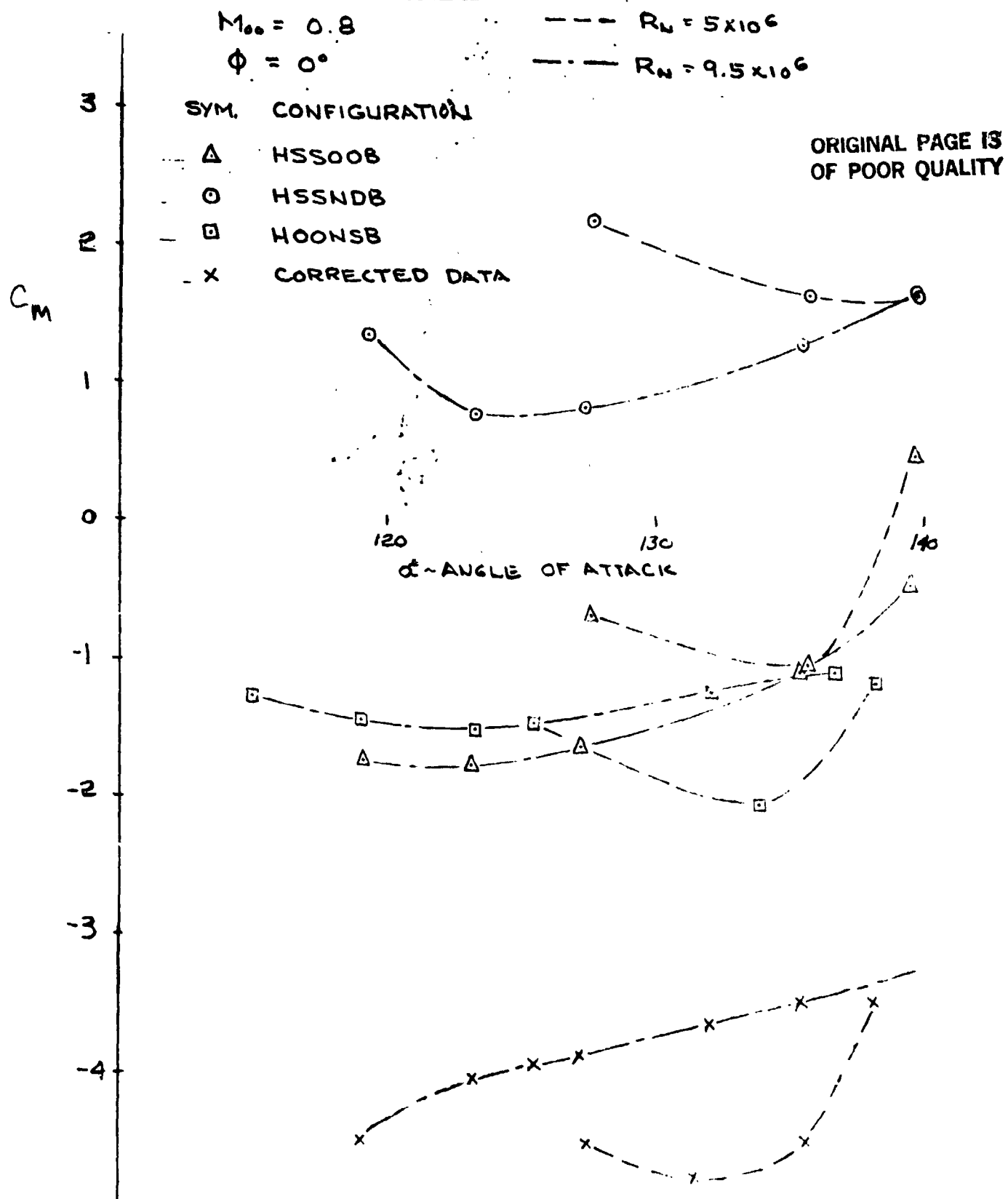


Fig. D-59 - Pitching Moment Data, HRWT Nose Mount,  $M_{\infty} = 0.8$ ,  $\phi = 0$  deg

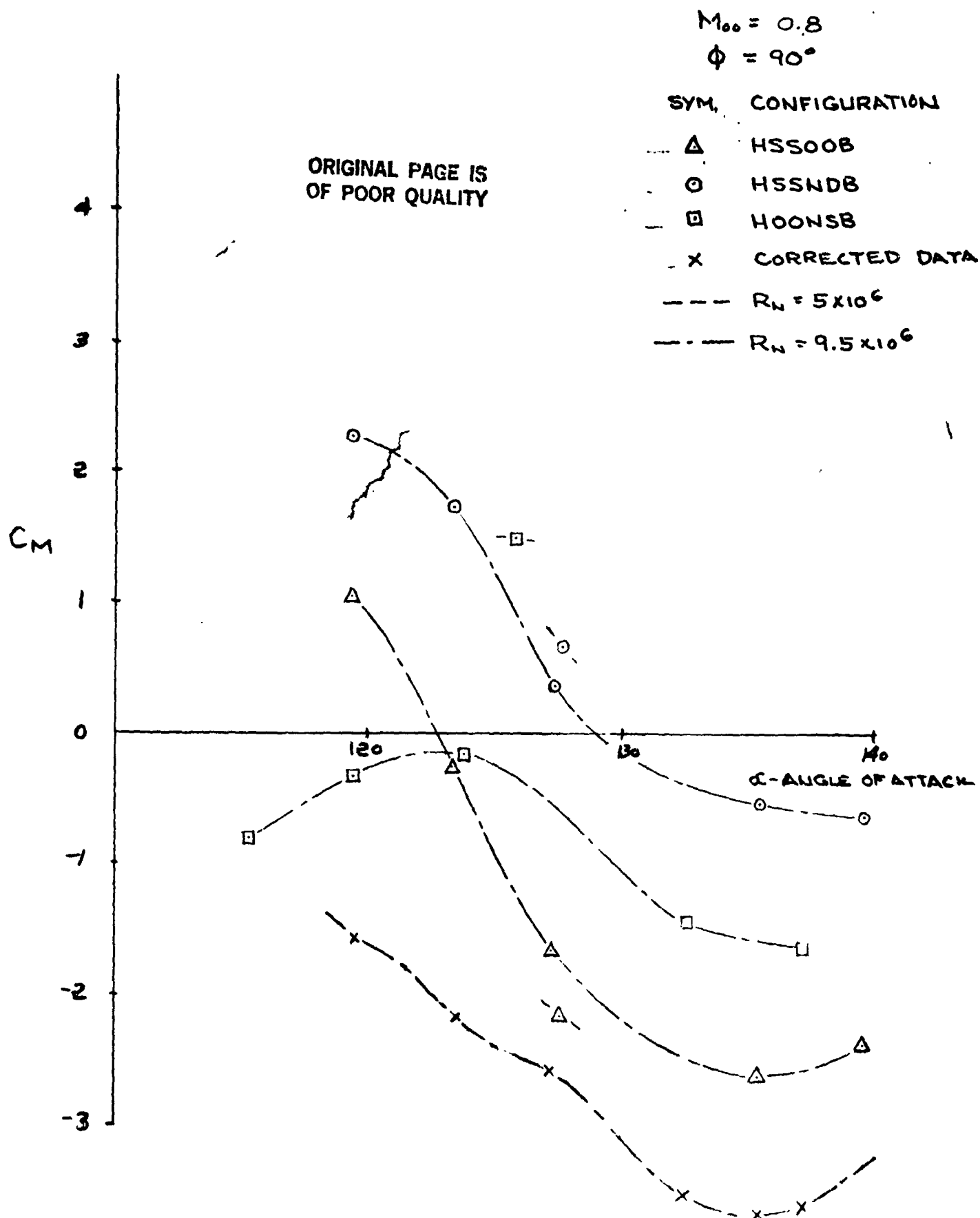


Fig. D-60 - Pitching Moment Data, HRWT Nose Mount,  $M_{\infty} = 0.8$ ,  $\phi = 90^\circ$

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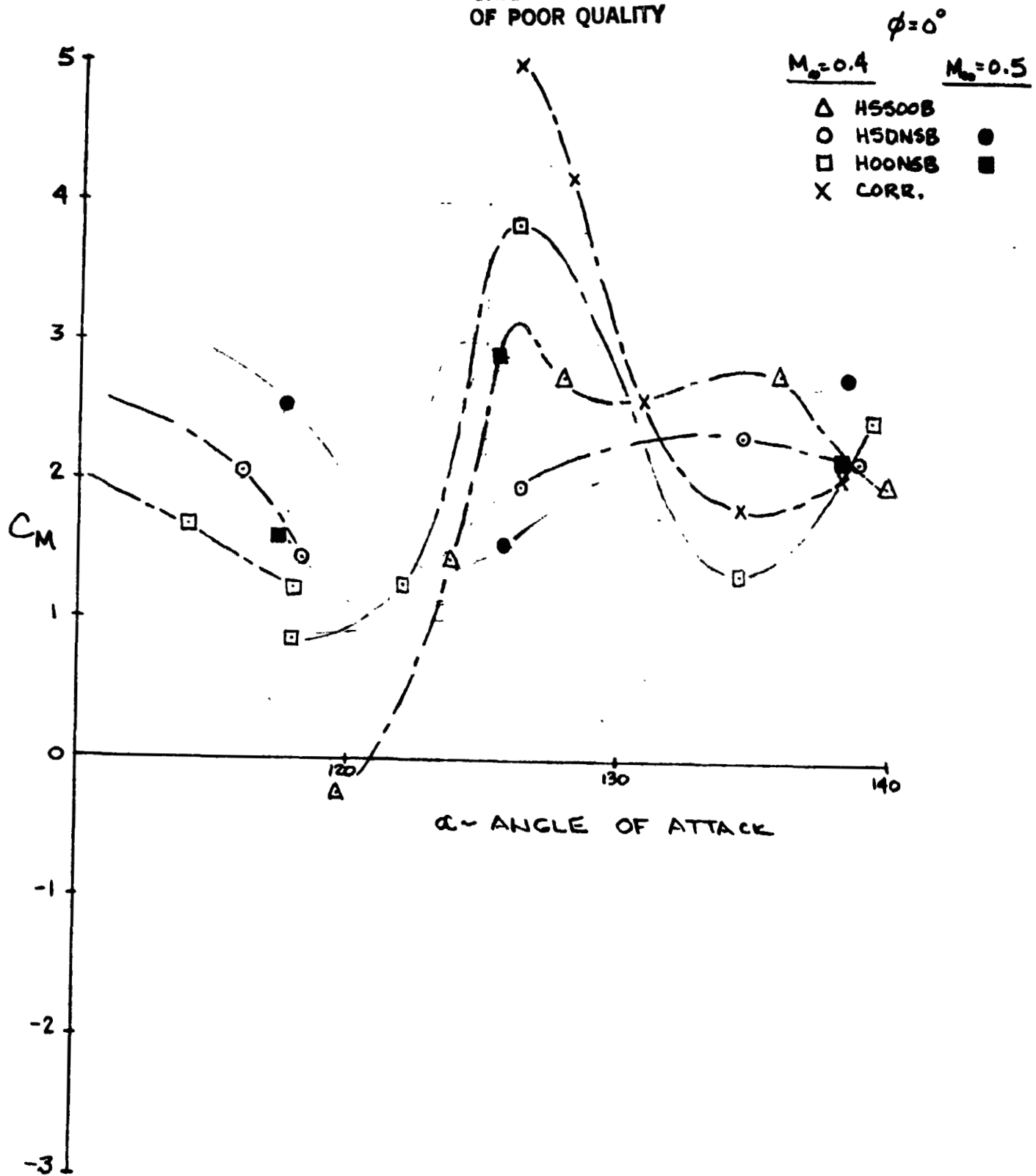


Fig. D-61 - Pitching Moment Data, HRWT Nose Mount,  $M_\infty = 0.4, 0.5$ ,

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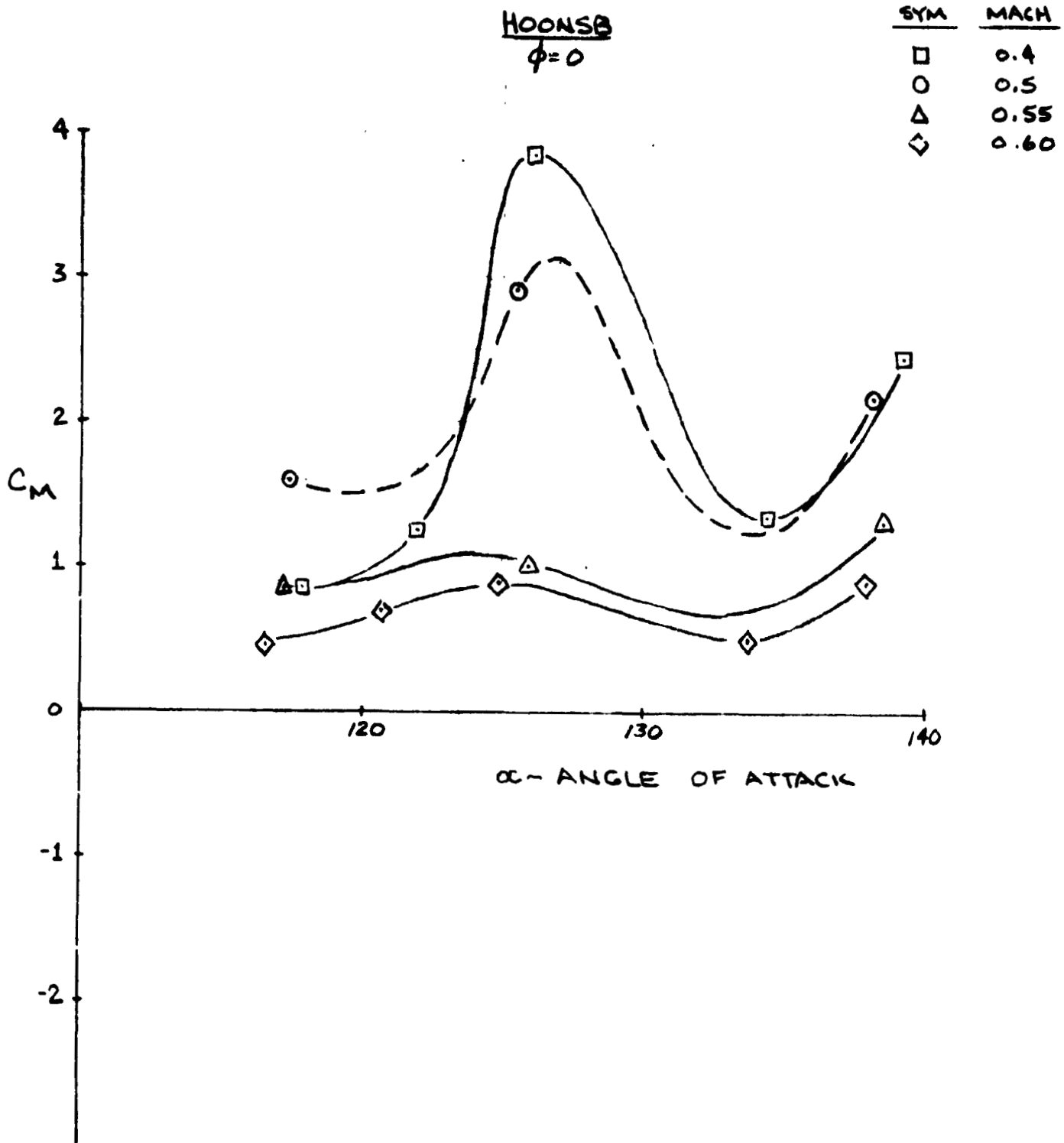


Fig. D-62 - Pitching Moment Data, HRWT Nose Mount,  $M_\infty = 0.4, .5, .55, .6$



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HSDNSB  
 $\phi = 0$

SYM	MACH
□	0.4
○	0.5
△	0.55
◇	0.6

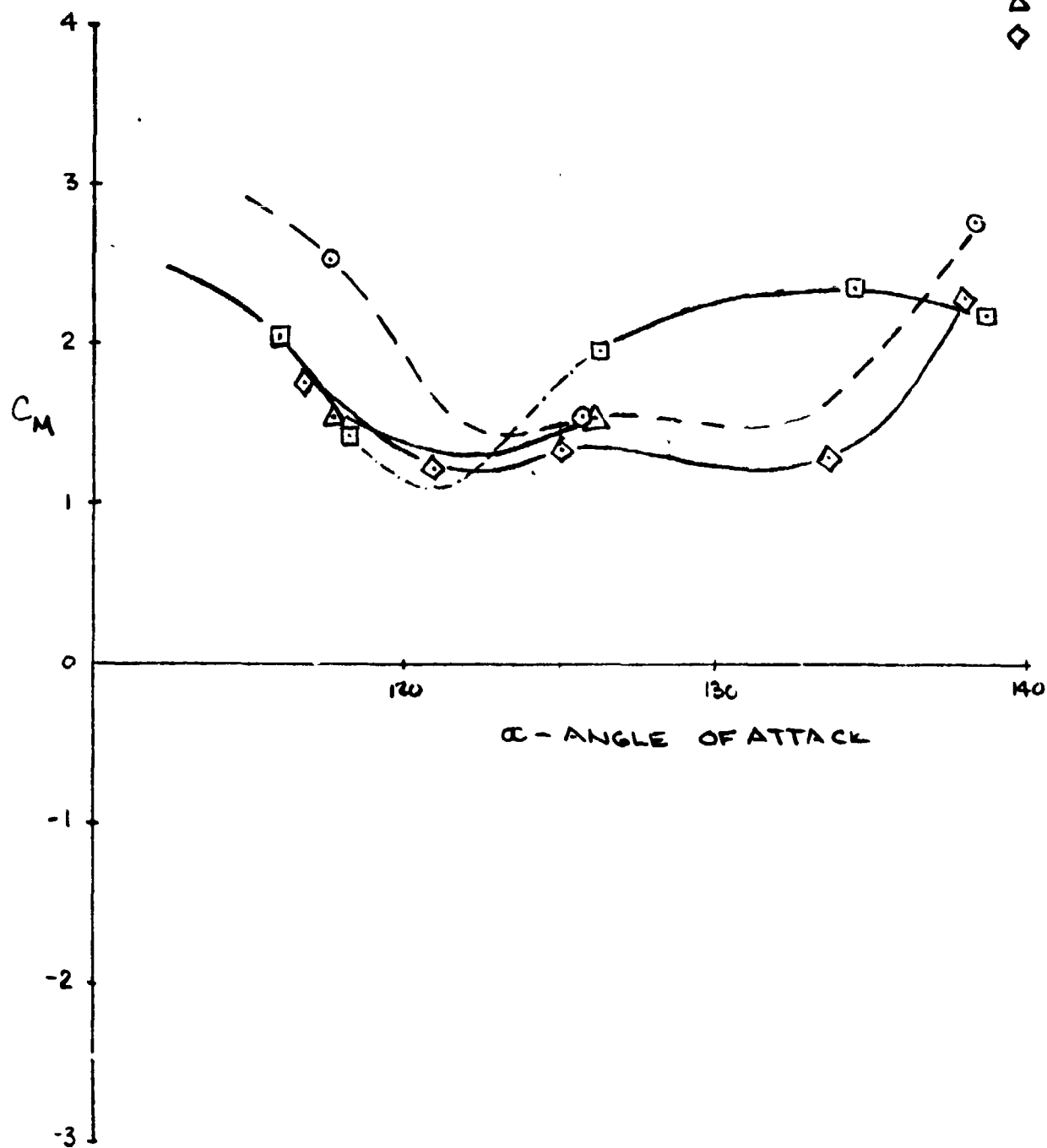


Fig. D-63 - Pitching Moment Data, HRWT Side Dummy,  $M_\infty = 0.4, .5, .55, .6$

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SYM	MACH NO.
□	0.4
○	0.5
△	0.55
◇	0.6

SIDE MOUNT  
STING INTERFERENCE

$$R_N = 9.5 \times 10^6$$

$$\phi = 0^\circ$$

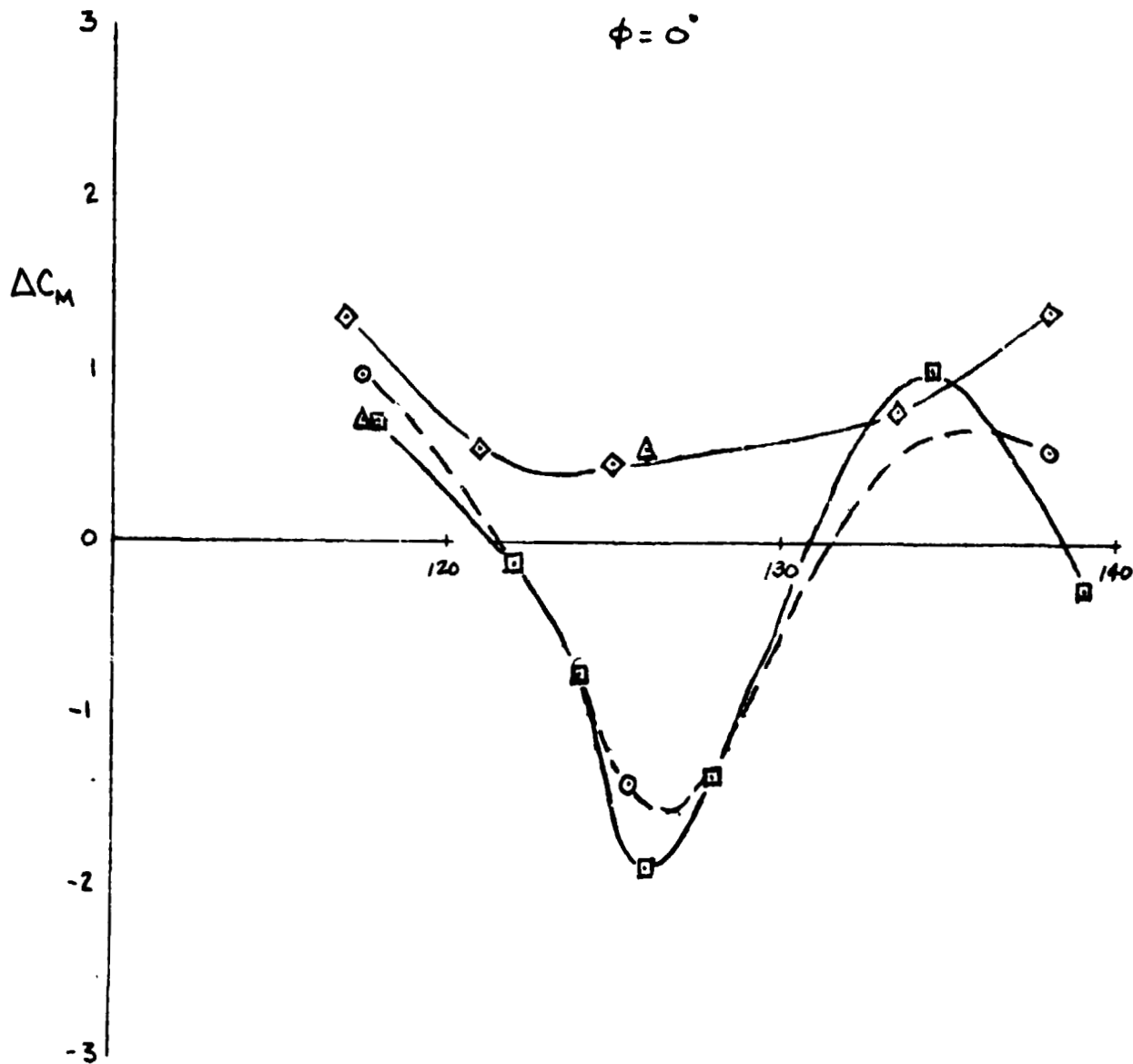


Fig. D-64 - Pitching Moment Data, HRWT Side Mount Sting Interference

$$M_{\infty} = 0.4$$

$$\phi = 0$$

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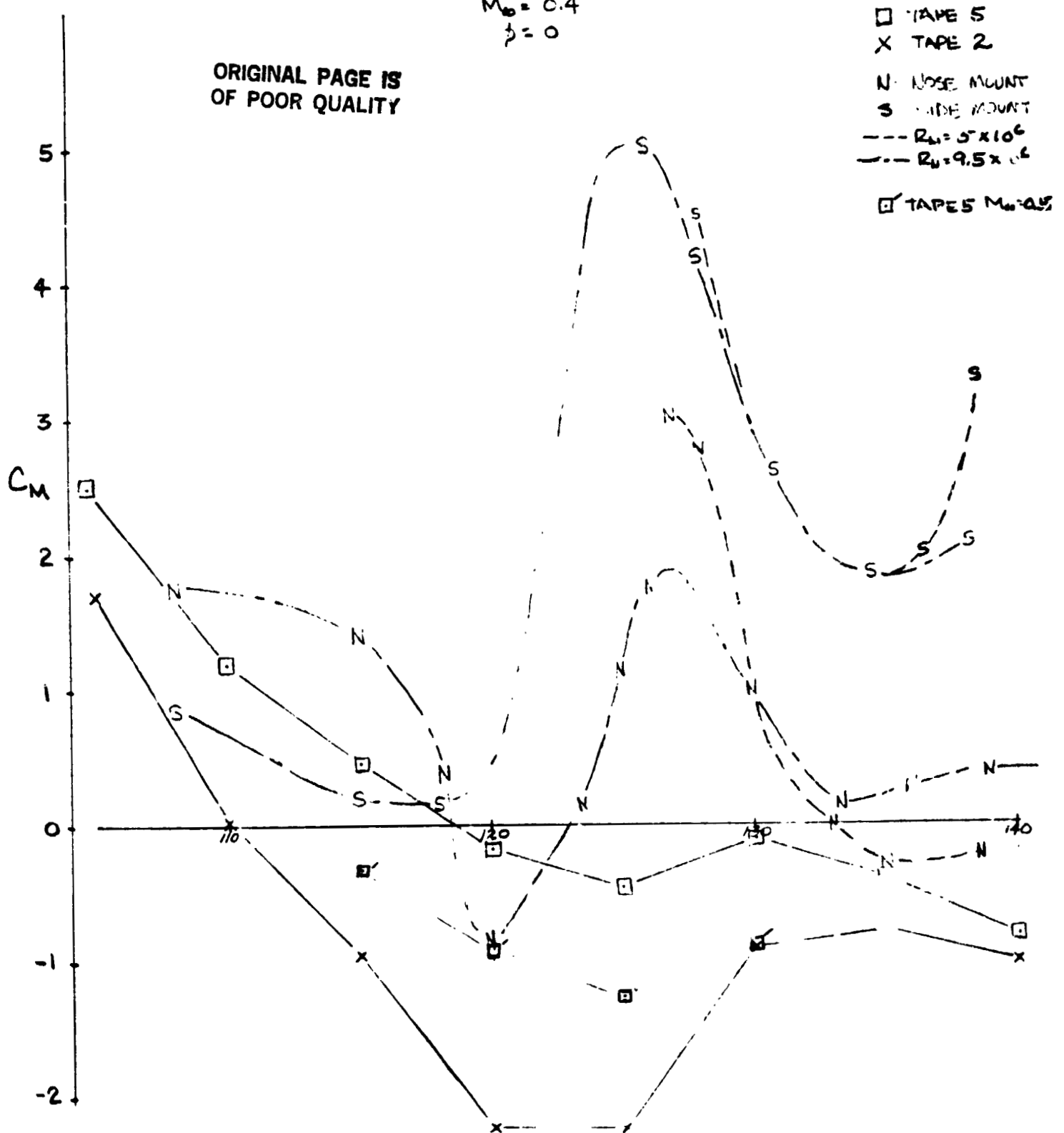


Fig. D-65 - Summary Corrected Pitching Moment Data,  $M_{\infty} = 0.4$ ,  $\phi = 0$  deg

$M_{\infty} = 0.4$

$\phi = 90^\circ$

- TAPE 5
- X TAPE 2
- N NOSE MOUNT
- S SIDE MOUNT
- $R_L = 5 \times 10^6$
- $R_L = 9.5 \times 10^6$
- TAPE 5  $M_{\infty} = 0.5$

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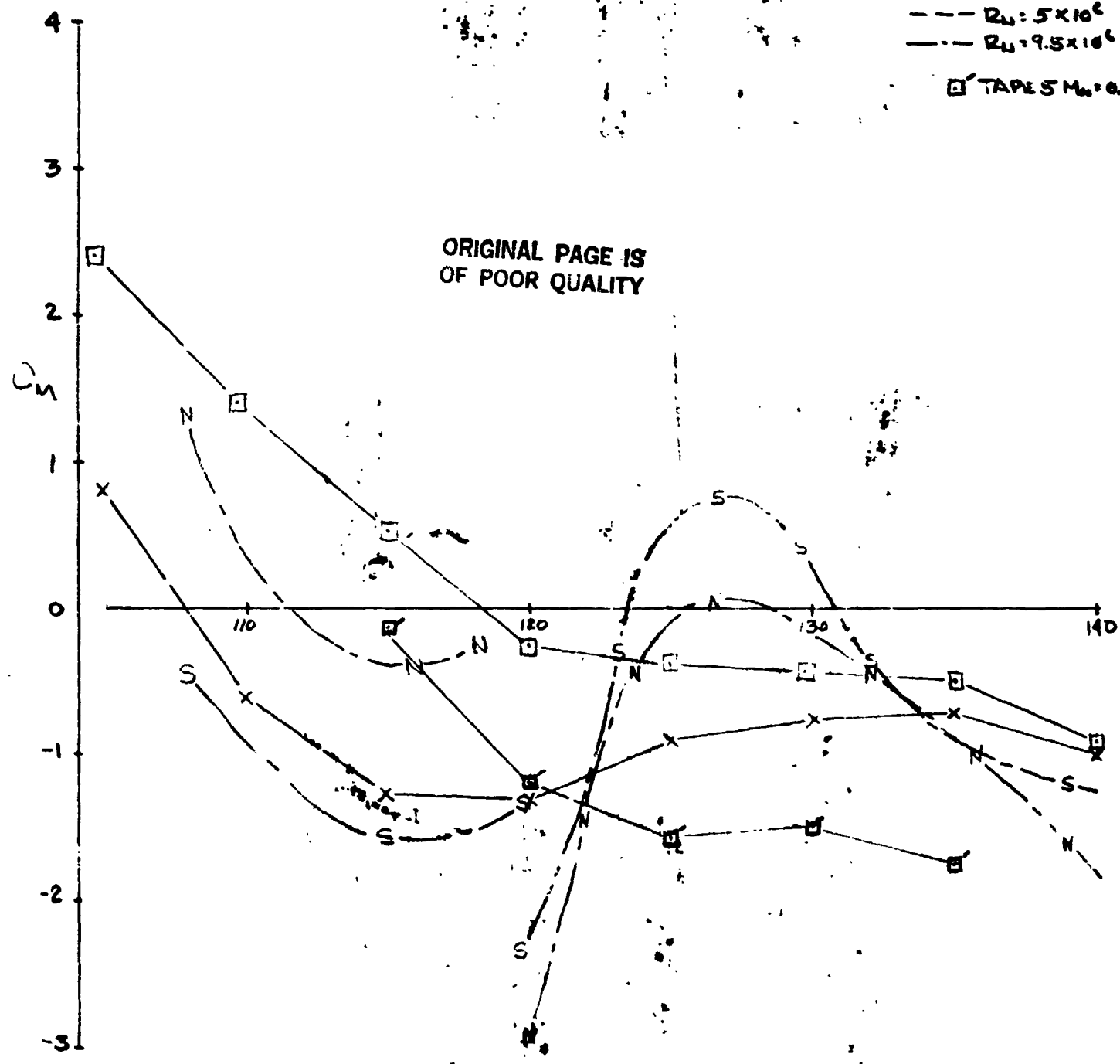


Fig. D-66 - Summary Corrected Pitching Moment Data,  $M_{\infty} = 0.4$ ,  $\phi = 90^\circ$

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$M_{\infty} = 0.6$

$\phi = 0$

□ TAPE 5  
X TAPE 2

N - NOSE MOUNT  
S - SIDE MOUNT

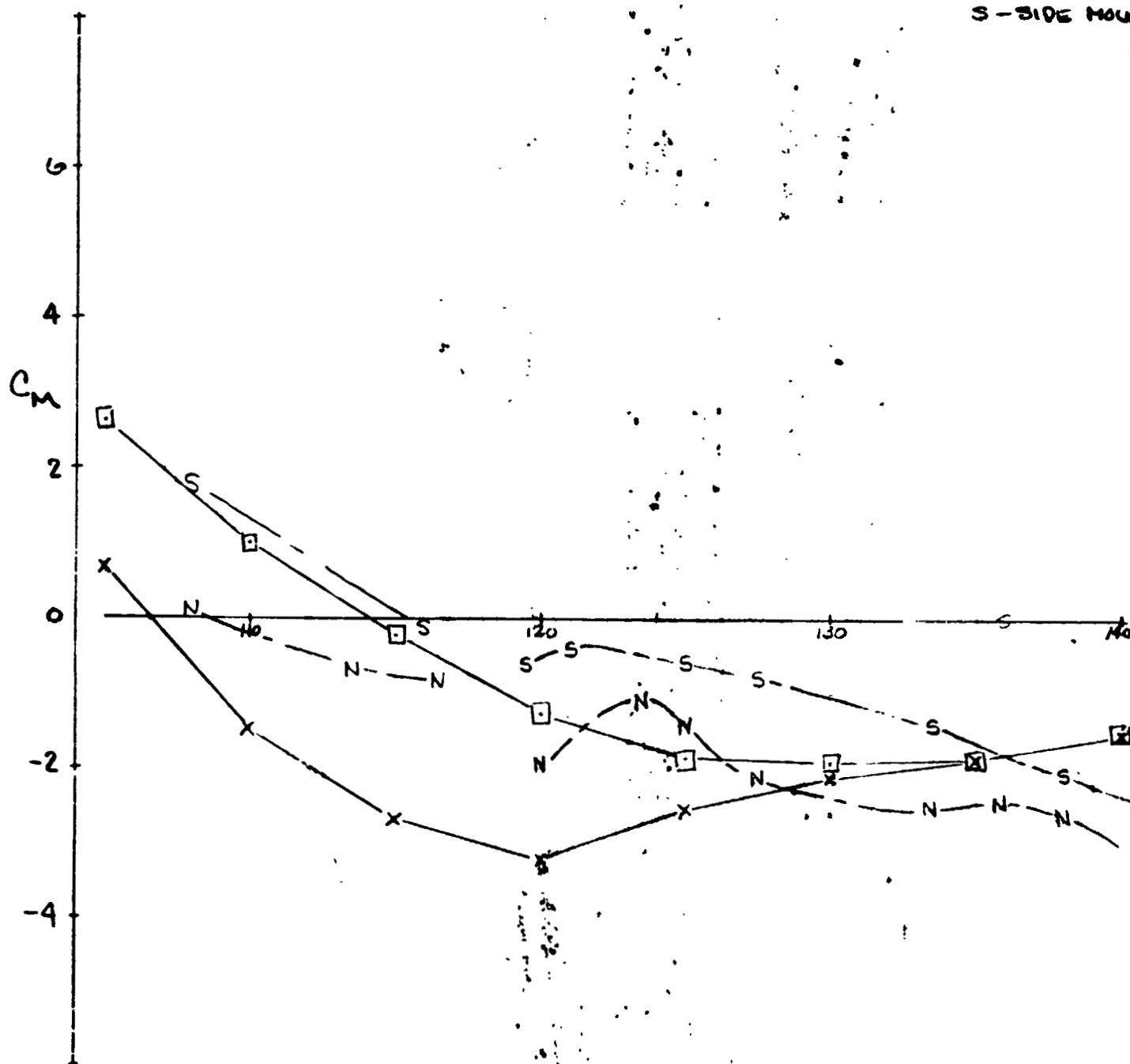


Fig. D-67 - Summary Corrected Pitching Moment Data,  $M_{\infty} = 0.6$ ,  $\phi = 0^\circ$

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$M_\infty = 0.6$   
 $\phi = 90^\circ$

□ TAKE 5  
x TAKE 2  
N - NOSE MOUNT  
S - SIDE MOUNT

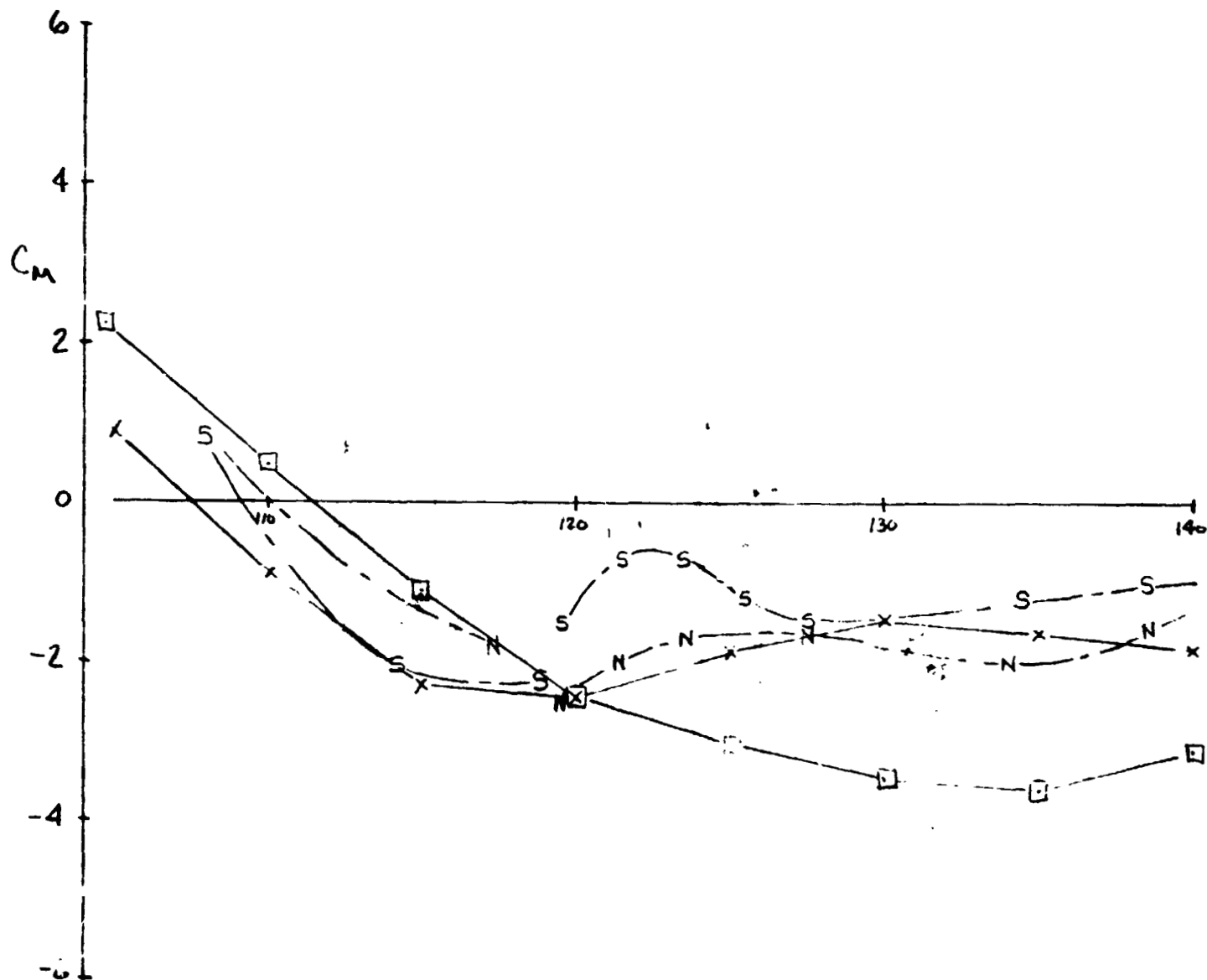


Fig. D-68 - Summary Corrected Pitching Moment Data,  $M_\infty = 0.6$ ,  $\phi = 90^\circ$

$M_{\infty} = 0.6$   
 $\phi = 0$

SYMBOL DATA

□ TAPE 5

x TAPE 2

▬ TWT 660 CORR.

I HWWT 042 CORR.

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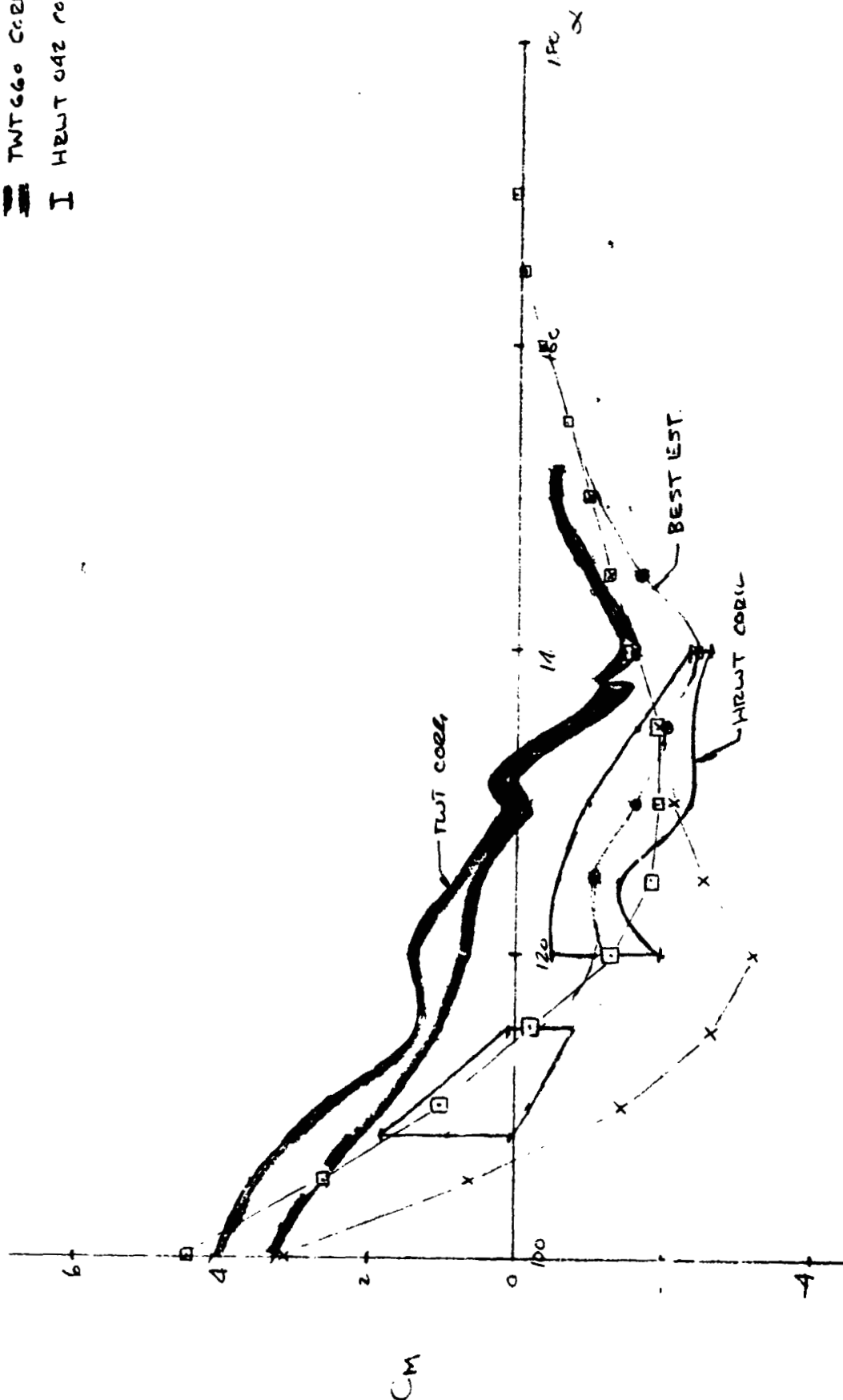


Fig. D-69 - Expanded Summary Pitching Moment Data,  $M_{\infty} = 0.6$ ;  $\phi = 0$  deg

$M_{\infty} = 0.6$   
 $\phi = 90^\circ$

SYM. DATA  
 □ TAPE 5  
 x TAPE 2

■ TWT 660 CORR.  
 I HEWT 042 CORR.

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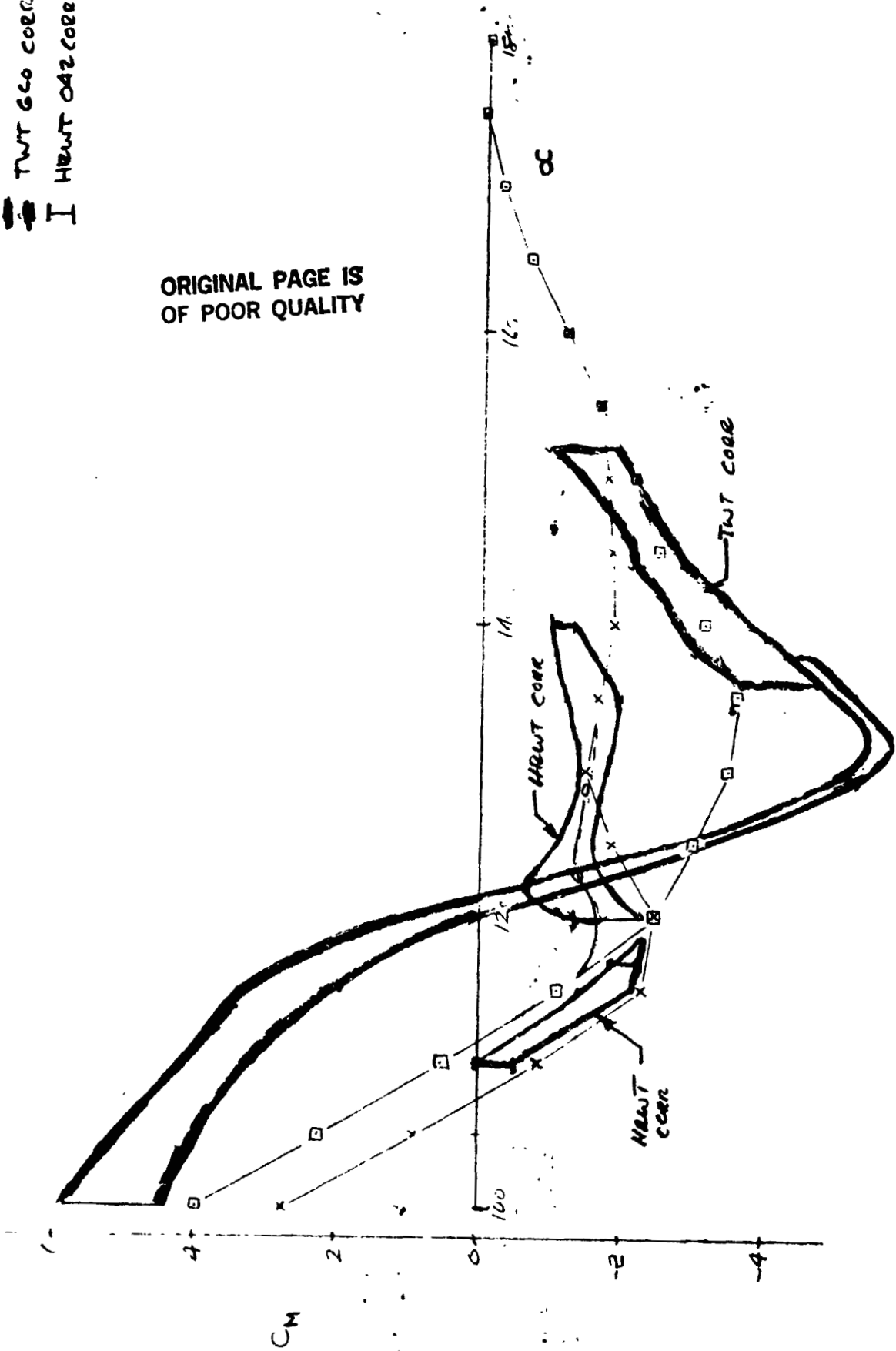


Fig. D-70 - Expanded Summary Pitching Moment Data,  $M_{\infty} = 0.6$ ,  $\phi = 90^\circ$



$M_{\infty} = 0.5$

$\phi = 0$

□ TAFE 5  
X TAFE 2  
N-NOSE MOUNT  
S-SIDE MOUNT

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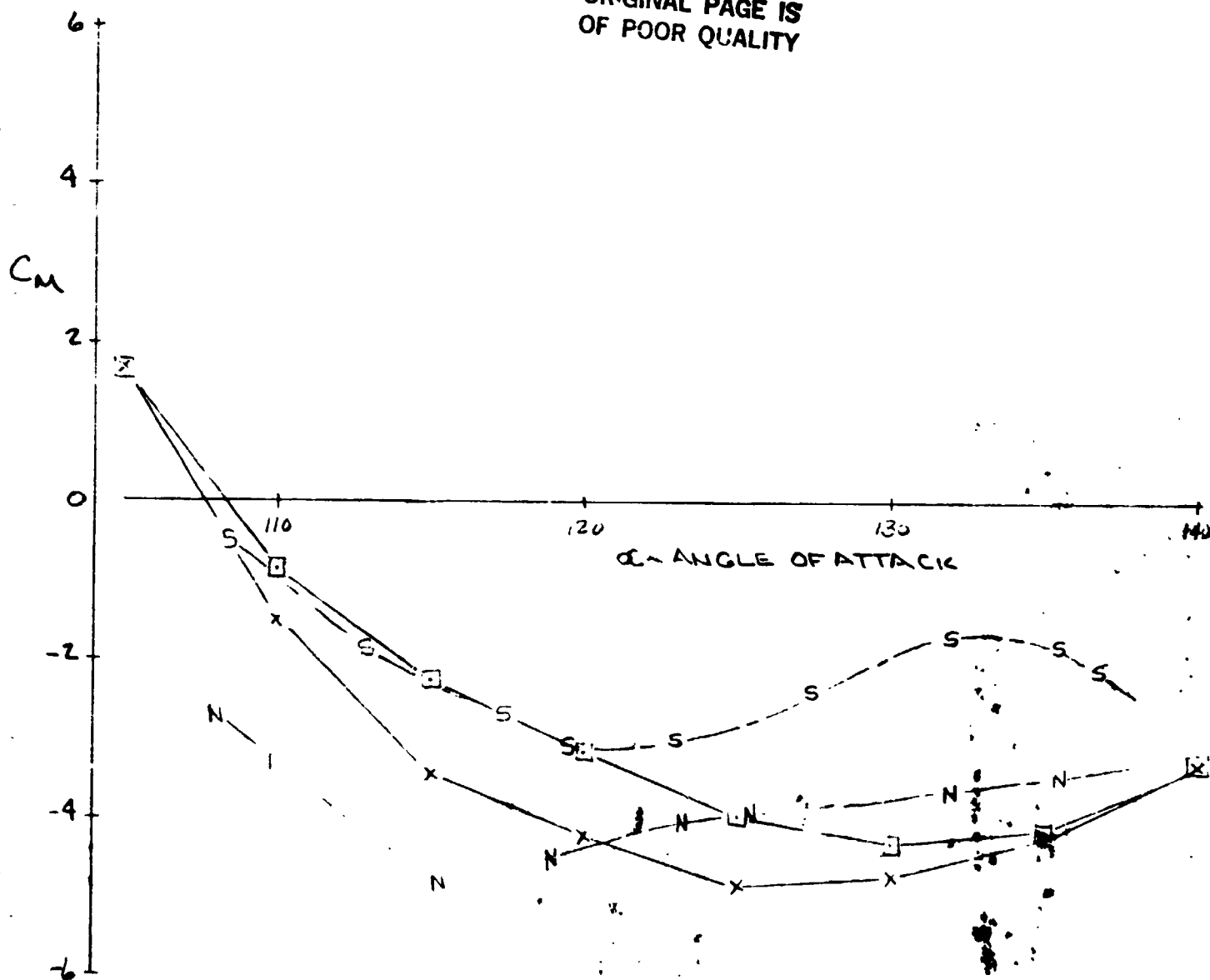


Fig. D-71 - Summary Corrected Pitching Moment Data,  $M_{\infty} = 0.8$ ,  $\phi = 0$  deg

$M_{\infty} = 0.5$

$\phi = 90$

□ TABLE 3  
 x TABLE 1  
 N-NOSE MOUNT  
 S-SIDE MOUNT

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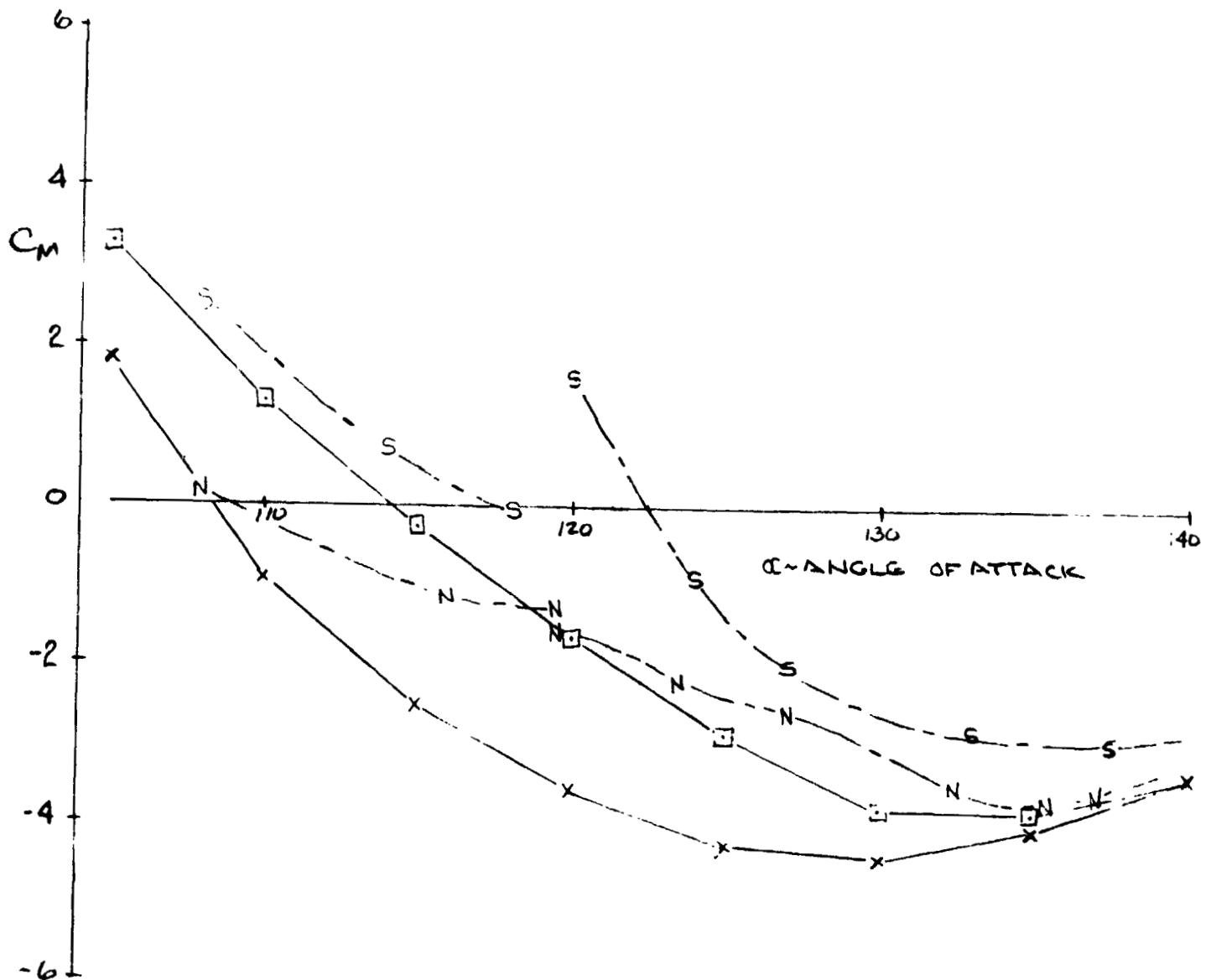


Fig. D-72 - Summary Corrected Pitching Moment Data,  $M_{\infty} = 0.8$ ,  $\phi = 90$  deg

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$M_{\infty} = 0.8$   
 $\phi = 0$

SYM. DATA  
□ - TAPE 5  
x - TAPE 2  
— TWT660 CORR.  
— HRWT042 CORR.

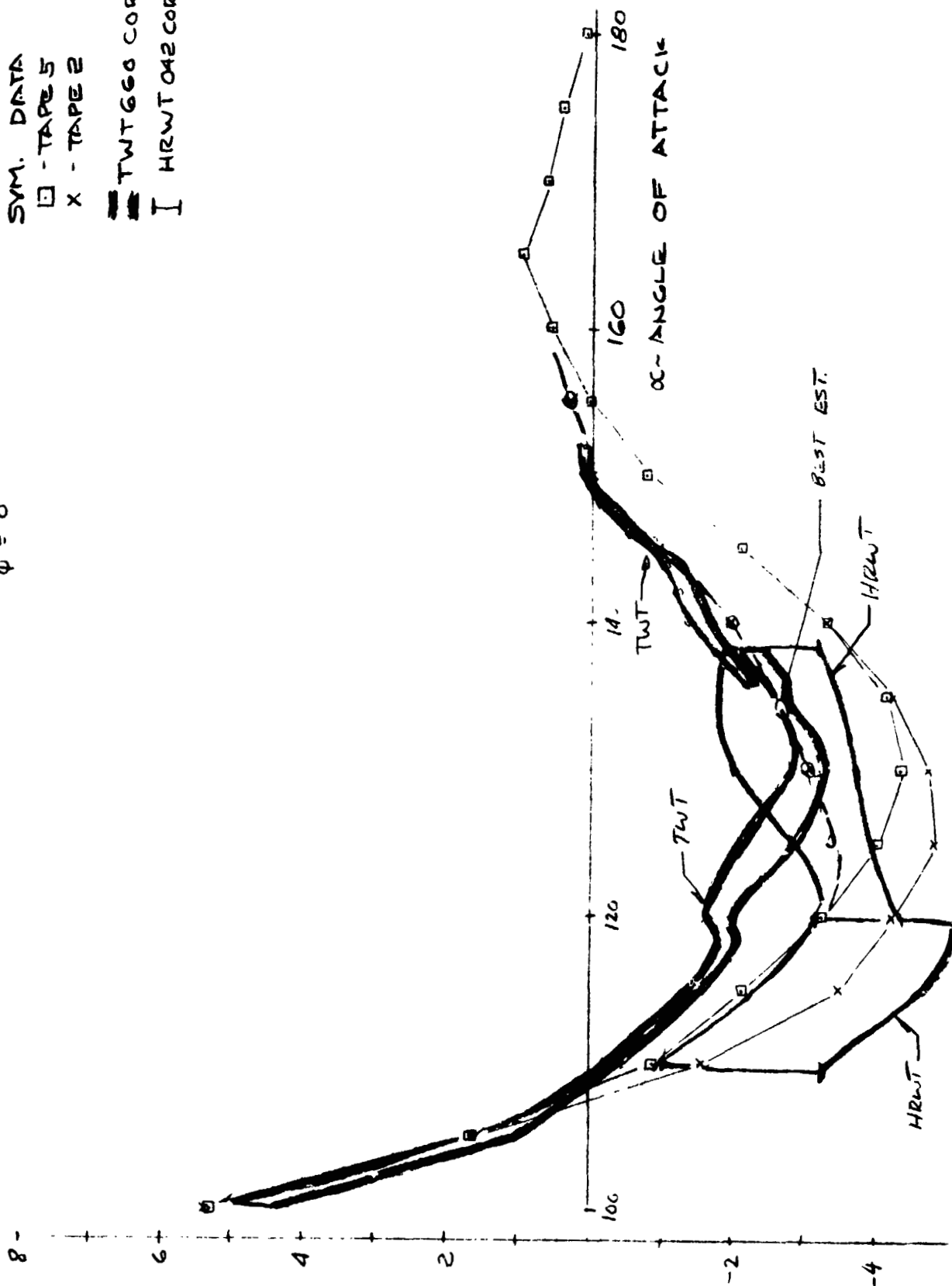


Fig. D-73 ~ Expanded Summary Pitching Moment Data,  $M_{\infty} = 0.8$ ,  $\phi = 0$  deg

$M_{\infty} = 0.8$   
 $\phi = 90^\circ$

SYN. DATA  
 □ TAPE 5  
 x TAPE 2  
 — TWT660 CORR.  
 I HRLWT 042 CORR.

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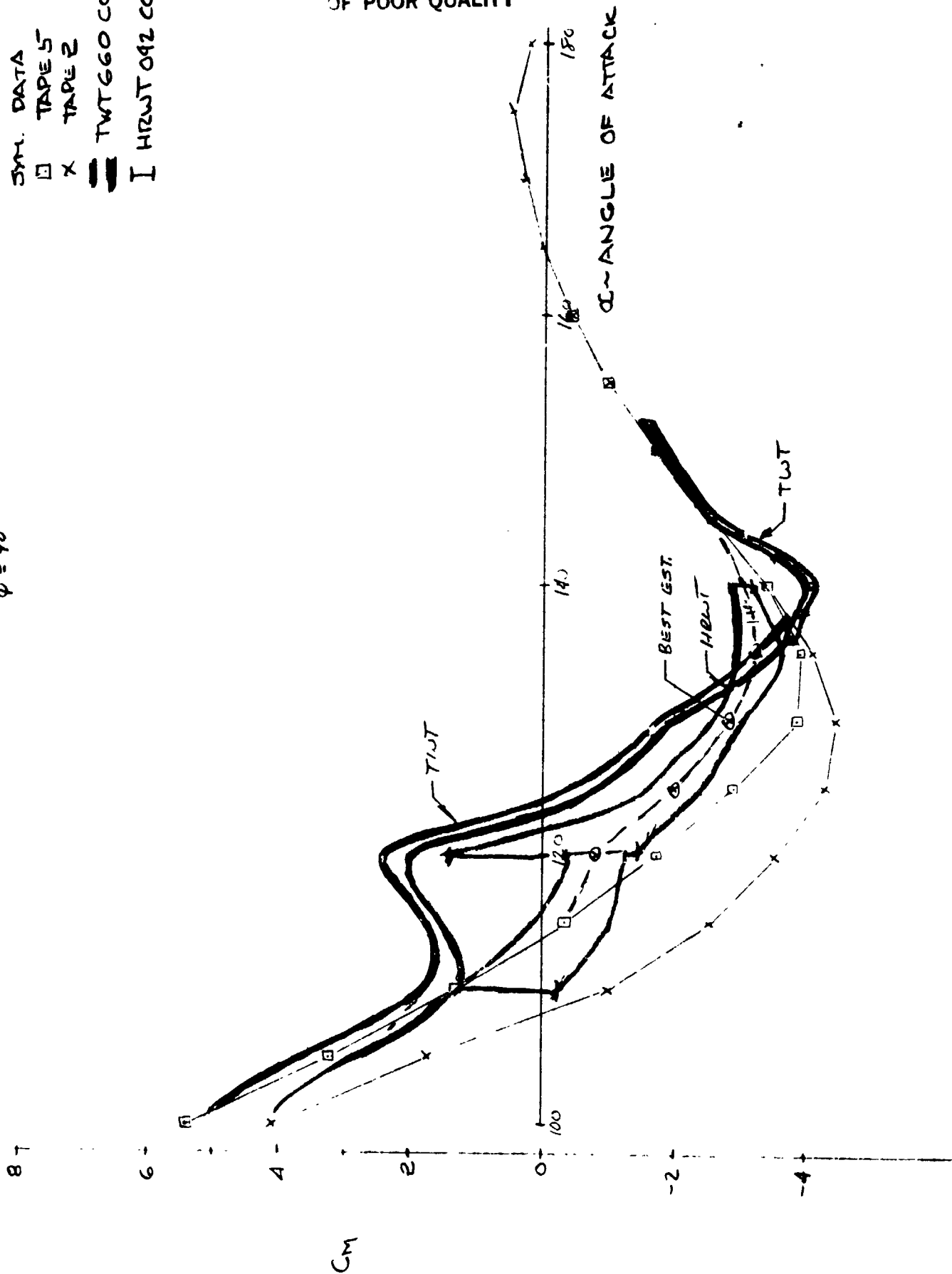


Fig. D-74 - Expanded Summary Pitching Moment Data,  $M_{\infty} = 0.8$ ,  $\phi = 90^\circ$

$\phi = 0$   
 $\alpha = 125^\circ$

SYM. CONFIG.  
 □ - TAPE HS  
 IT - CORRECTED TWT660  
 N - CORRECTED HWJT 04:

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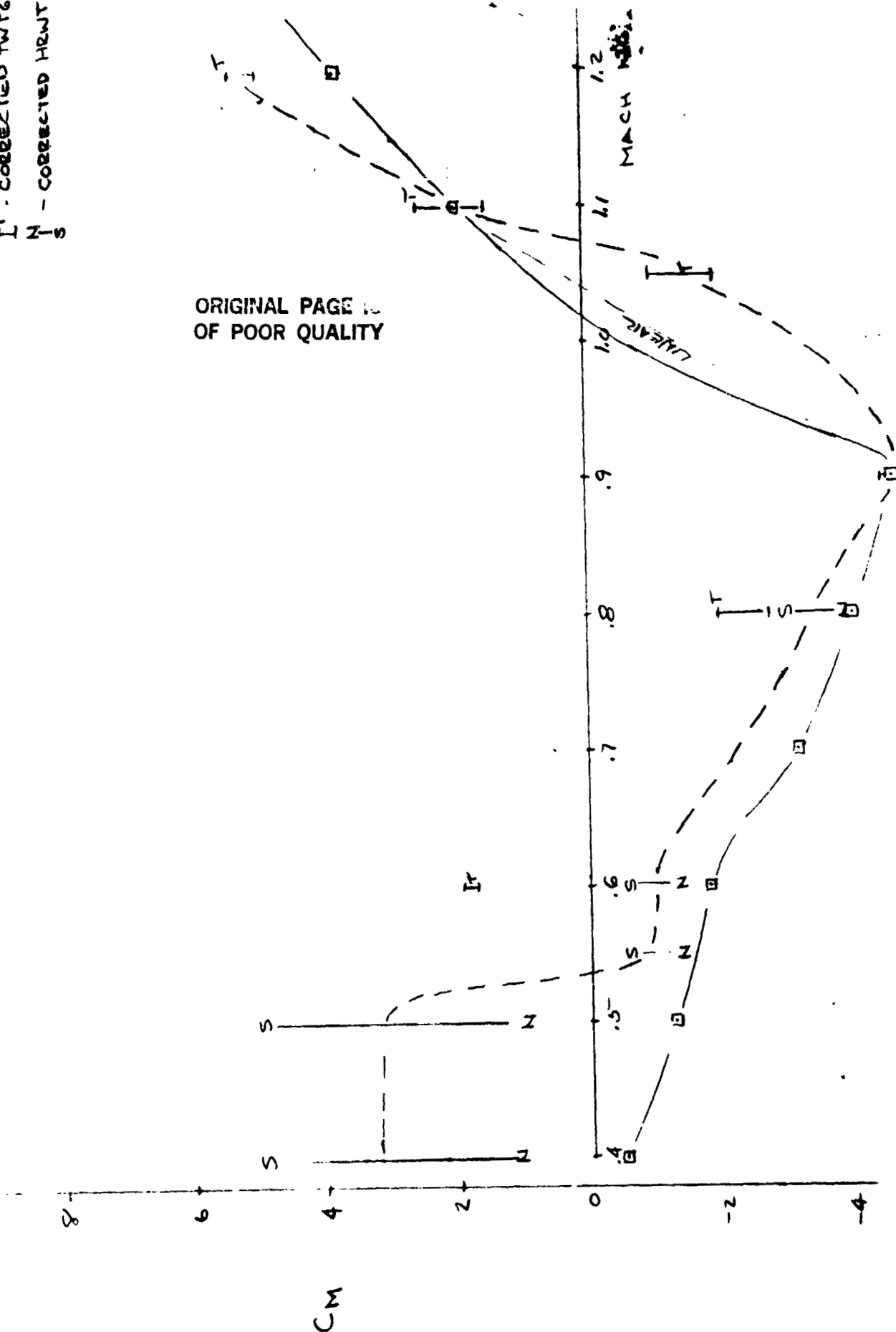


Fig. D-75 - Pitching Moment versus Mach number,  $\alpha = 125^\circ$ ,  $\phi = 0^\circ$

$\phi = 90^\circ$   
 $\alpha = 125^\circ$

SYM, CONFIG.  
 □ TAPES 145  
 IT - CORRECTED TWT 660 DATA  
 S - CORRECTED HEWT 042 DATA

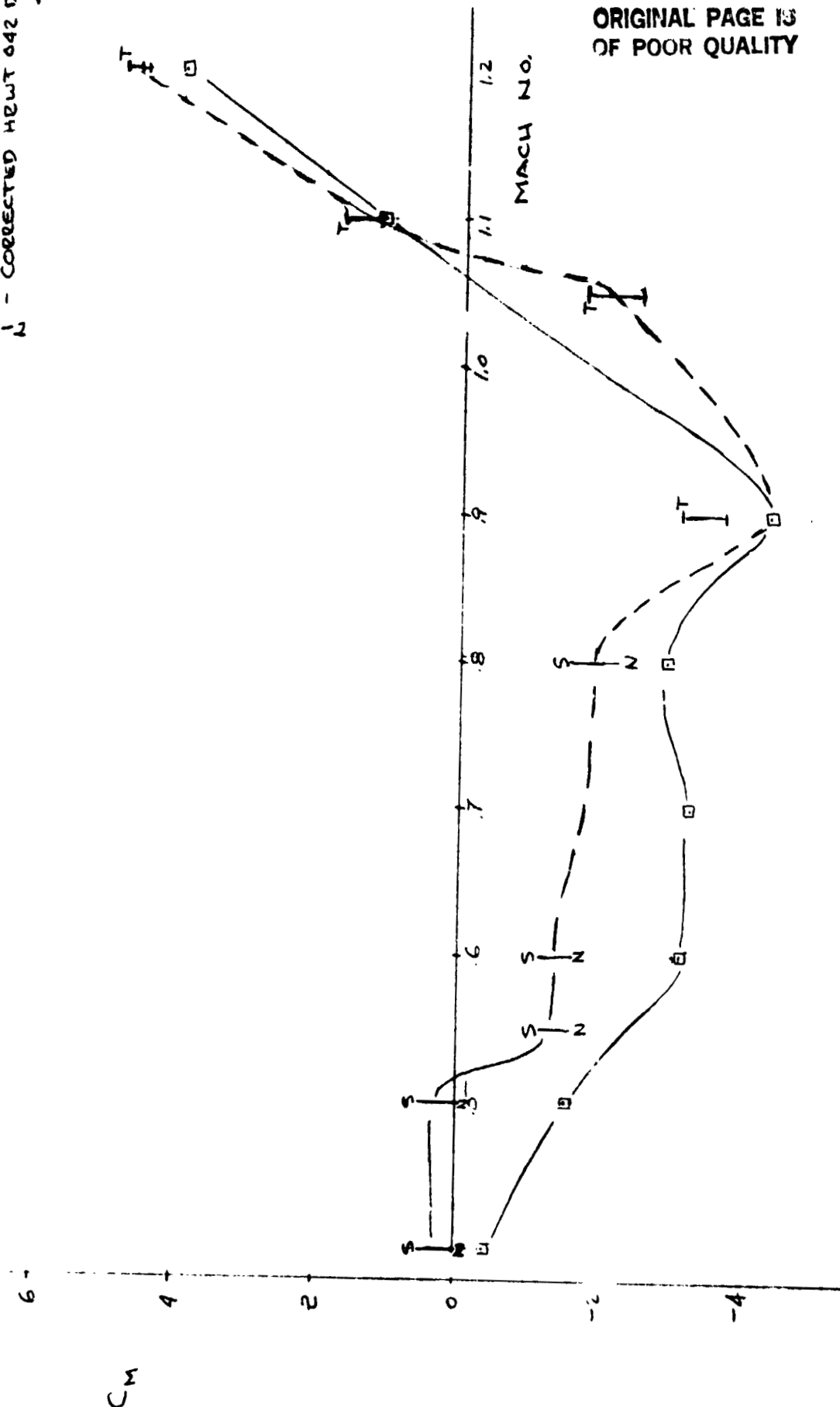


Fig. D-76 - Pitching Moment versus Mach number,  $\alpha = 125^\circ$ ,  $\phi = 90^\circ$



TABLE D- 1

MACH= 0.600  
ROLL= 0.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNOC	CN MSOOC	DEL CN MSM	CN MSM
136.00	7.6592	6.9608	6.4566	-0.6974	7.1542
138.00	6.5388	6.4467	6.0085	-0.0921	6.1006
140.00	5.8145	6.0241	5.5947	0.2096	5.3850
142.00	5.3776	5.6008	5.2311	0.2233	5.0078
144.00	5.0009	5.2122	4.8833	0.2113	4.6719
146.00	4.5967	4.7830	4.4082	0.1863	4.3019
148.00	4.2211	4.3702	4.1262	0.1491	3.9771
150.00	3.8478	4.0030	3.7356	0.1553	3.5804
152.00	3.4487	3.5624	3.3349	0.1137	3.2211

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MACH= 0.800  
ROLL= 0.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNOC	CN MSOOC	DEL CN MSM	CN MSM
136.00	8.7795	8.2803	7.9568	-0.1986	8.4554
138.00	8.1339	7.5913	7.3232	-0.1426	7.8658
140.00	7.4735	6.9431	6.7097	-0.5303	7.2400
142.00	6.7824	6.3800	6.1524	-0.4023	6.5548
144.00	6.1345	5.8351	5.6018	-0.2985	5.9002
146.00	5.5301	5.2811	5.0588	-0.2490	5.3078
148.00	4.9760	4.7651	4.5855	-0.2061	4.7916
150.00	4.4430	4.2347	4.1005	-0.2083	4.3088
152.00	3.9788	3.8178	3.6549	-0.1610	3.8160



TABLE D- 2

MACH= 0.900  
ROLL= 0.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALI HA	CN MSDNC	CN MSDNC	CN MSDNC	DEL CN MSM	CN MSM
136.00	9.5756	9.2020	8.9839	-0.3736	9.3575
138.00	8.9330	8.6051	8.4549	-0.3279	8.7828
140.00	8.2350	7.9953	7.8188	-0.2437	8.0625
142.00	7.5168	7.2547	7.0964	-0.2221	7.3185
144.00	6.7946	6.5515	6.3897	-0.2431	6.6328
146.00	6.1324	5.8919	5.7339	-0.2405	5.9745
148.00	5.5134	5.3191	5.1356	-0.1943	5.3299
150.00	4.8855	4.7495	4.5331	-0.1368	4.6691
152.00	4.3339	4.2227	3.9861	-0.1112	4.0974

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MACH= 1.050  
ROLL= 0.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSDNC	CN MSDNC	CN MSSOOC	DEL CN MSM	CN MSM
136.00	11.5865	10.8319	10.7926	-0.7546	11.5411
138.00	10.6963	10.0043	9.9789	-0.6940	10.6729
140.00	9.7175	9.0568	9.0865	-0.6207	9.7072
142.00	8.7476	8.1885	8.2087	-0.5592	8.7679
144.00	7.9896	7.4866	7.4889	-0.4230	7.9119
146.00	7.1265	6.8212	6.7353	-0.3053	7.0408
148.00	6.3522	6.1076	6.0316	-0.2547	6.2863
150.00	5.7097	5.4481	5.3774	-0.2615	5.6390
152.00	5.1308	4.8428	4.7894	-0.2860	5.0774

TABLE D- 3

MACH= 1.100  
 ROLL= 0.00  
 ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNCS	CN MSDUOC	DEL CN MSM	CN MSM
136.00	12.6007	11.9336	11.7665	-0.6671	12.4336
138.00	11.7589	11.1117	10.9132	-0.6472	11.5604
140.00	10.7948	10.2119	10.0003	-0.5829	10.5833
142.00	9.7817	9.2400	9.0964	-0.5337	9.6301
144.00	8.8214	8.3660	8.1968	-0.4554	8.6522
146.00	7.9027	7.5093	7.3930	-0.3934	7.7864
148.00	7.0332	6.6666	6.5165	-0.3667	6.8832
150.00	6.2495	5.9308	5.8772	-0.3167	6.1959
152.00	5.5492	5.2987	5.1852	-0.2505	5.4358

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MACH= 1.200  
 ROLL= 0.00  
 ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNCS	CN MSDUOC	DEL CN MSM	CN MSM
136.00	12.9171	12.3771	12.2604	-0.5400	12.8004
138.00	12.0383	11.5589	11.3873	-0.4795	11.8668
140.00	11.1449	10.7020	10.4941	-0.4429	10.9370
142.00	10.1517	9.7833	9.5755	-0.3684	9.9440
144.00	9.2013	8.8660	8.6763	-0.3352	9.0121
146.00	8.3328	8.0163	7.9044	-0.3165	8.2289
148.00	7.4993	7.2144	7.0574	-0.2849	7.3423
150.00	6.7168	6.4625	6.3160	-0.2543	6.5703
152.00	5.9841	5.7559	5.5655	-0.2281	5.7936

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TUT 660 SRB STING INTERFERENCE STUDY-INTERPOLATED DATA NOV 81

TABLE D- 4

MACH= 1.460  
ROLL= 0.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MDSNC	CN MDSNC	CN MSSOOC	DEL CN MSM	CN MSM
136.00	12.0013	11.5937	11.5951	-0.4076	12.0028
138.00	11.2092	10.9386	10.8785	-0.3506	11.2290
140.00	10.5463	10.2401	10.1362	-0.3062	10.4423
142.00	9.7814	9.5075	9.3504	-0.2739	9.6244
144.00	8.9602	8.7386	8.5816	-0.2216	8.8033
146.00	8.1943	7.9814	7.8495	-0.2129	8.0623
148.00	7.4878	7.2763	7.1309	-0.2115	7.3425
150.00	6.8926	6.6603	6.4567	-0.2243	6.6810
152.00	6.2929	6.0583	5.7249	-0.2346	5.9596

MACH= 0.600  
ROLL= 45.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MDSNC	CN MDSNC	CN MSSOOC	DEL CN MSM	CN MSM
136.00	5.6586	5.1254	4.8306	-0.5332	5.3638
138.00	5.2754	4.7514	4.4768	-0.5240	5.0008
140.00	5.0215	4.5476	4.2691	-0.4738	4.7430
142.00	4.9000	4.3892	4.0856	-0.5108	4.5964
144.00	4.5435	4.0651	3.7787	-0.4784	4.2571
146.00	4.1399	3.6832	3.3999	-0.4567	3.8565
148.00	3.6512	3.2723	3.0362	-0.3789	3.4151
150.00	3.2547	2.9139	2.6980	-0.3408	3.0387
152.00	2.9128	2.5962	2.4025	-0.3166	2.7191

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TJ-660 SRB STING INTERFERENCE STUDY-INTERPOLATED DATA NOV 81

TABLE D- 5

MACH= 0.800  
ROLL= 45.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNCS	CN MSSOOC	DEL CN MSM	CN MSM
136.00	7.3148	6.7923	6.5383	-0.5224	7.0607
138.00	6.7378	6.1515	5.8972	-0.5863	6.4835
140.00	6.0396	5.5995	5.3374	-0.4401	5.7775
142.00	5.5468	5.2426	5.0023	-0.3041	5.2064
144.00	5.0100	4.7733	4.5097	-0.2360	4.7465
146.00	4.4328	4.1775	3.9650	-0.2553	4.2203
148.00	3.8582	3.6750	3.4399	-0.1832	3.6731
150.00	3.4176	3.2469	3.0541	-0.1707	3.2248
152.00	3.0022	2.8576	2.6544	-0.1447	2.7991

MACH= 0.900  
ROLL= 45.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNCS	CN MSSOOC	DEL CN MSM	CN MSM
136.00	8.3591	8.0206	7.8484	-0.3385	8.1869
138.00	7.7568	7.3235	7.1916	-0.4334	7.6250
140.00	7.1652	6.6887	6.5105	-0.4765	6.9870
142.00	6.5895	6.1083	5.9443	-0.4812	6.4255
144.00	5.9927	5.4936	5.3661	-0.4991	5.8652
146.00	5.2963	4.8922	4.7364	-0.4141	5.1505
148.00	4.5943	4.1951	4.0778	-0.3991	4.4770
150.00	3.9907	3.6898	3.5062	-0.3009	3.8151
152.00	3.4647	3.1656	3.0177	-0.2991	3.3168

TABLE D- 6

MACH = 1.050  
 ROLL = 45.00  
 ALPP = 145.0

## CN IMPSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNOC	CN MSDOOC	DEL CN MSM	CN MSM
136.00	10.6569	10.0276	9.8250	-0.6293	10.4551
138.00	9.7623	9.1619	9.0008	-0.6004	9.6012
140.00	8.7450	8.2906	8.1105	-0.4545	8.5650
142.00	7.8053	7.4854	7.3351	-0.3199	7.6550
144.00	7.0183	6.7850	6.6409	-0.2332	6.8742
146.00	6.3070	6.1430	5.9806	-0.1640	6.1446
148.00	5.5991	5.4577	5.3055	-0.1414	5.4469
150.00	4.9499	4.7744	4.6175	-0.1755	4.7930
152.00	4.4269	4.2299	4.1151	-0.1970	4.3121

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MACH = 1.100  
 ROLL = 45.00  
 ALPP = 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNOC	CN MSDOOC	DEL CN MSM	CN MSM
136.00	11.4436	10.9162	10.6720	-0.5274	11.1994
138.00	10.6183	10.0984	9.8526	-0.5199	10.3725
140.00	9.7555	9.2663	9.0012	-0.4892	9.4904
142.00	8.8513	8.4670	8.1097	-0.3843	8.5739
144.00	7.9939	7.6645	7.3429	-0.3294	7.6723
146.00	7.0957	6.8425	6.5507	-0.2532	6.8039
148.00	6.2034	6.0466	5.7871	-0.1568	5.9439
150.00	5.4592	5.3000	5.0885	-0.1583	5.2468
152.00	4.7600	4.6085	4.4039	-0.1515	4.5554

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TABLE D- 7

MACH= 1.200  
ROLL= 45.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNC	CN MSOOC	DEL CN MSM	CN MSM
136.00	11.7561	11.3176	11.2375	-0.4386	11.6760
138.00	10.8470	10.4953	10.3669	-0.3517	10.7186
140.00	10.0039	9.6631	9.5252	-0.3408	9.8660
142.00	9.2171	8.8496	8.7233	-0.3675	9.0908
144.00	8.4203	8.0634	7.8793	-0.3569	8.2362
146.00	7.5661	7.2481	7.0829	-0.3180	7.4009
148.00	6.6954	6.4285	6.3019	-0.2670	6.5689
150.00	5.9037	5.6759	5.5886	-0.2279	5.8165
152.00	5.1914	4.9567	4.8693	-0.2348	5.1041

MACH= 1.460  
ROLL= 45.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNC	CN MSOOC	DEL CN MSM	CN MSM
136.00	11.4117	10.9604	10.9685	-0.4513	11.4190
138.00	10.6795	10.2677	10.2596	-0.4119	10.6714
140.00	9.9376	9.5644	9.5135	-0.3732	9.8867
142.00	9.1970	8.8495	8.7633	-0.3475	9.1107
144.00	8.4357	8.1164	8.0197	-0.3193	8.3390
146.00	7.6513	7.3738	7.2525	-0.2775	7.5300
148.00	6.8840	6.6400	6.5117	-0.2440	6.7557
150.00	6.1545	5.9262	5.8184	-0.2283	6.0467
152.00	5.4465	5.2380	5.1307	-0.2086	5.3392

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TABLE D- 8

MACH= 0.600  
ROLL= 90.00  
ALPP= 145.0  
CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDN	CN MSDNC	CN MSDNC	CN MSDNC	DEL CN MSM	CN MSM
136.00	4.9632	4.6777	4.4076	-0.2855	4.6932		
138.00	4.8363	4.5316	4.2530	-0.3047	4.5577		
140.00	4.6428	4.3378	4.0788	-0.3050	4.3838		
142.00	4.3813	4.0845	3.8584	-0.2968	4.1552		
144.00	4.0974	3.8243	3.6137	-0.2732	3.8868		
146.00	3.8249	3.5670	3.3464	-0.2580	3.6044		
148.00	3.4245	3.2078	3.0199	-0.2167	3.2365		
150.00	3.0954	2.8868	2.7024	-0.2096	2.9120		
152.00	2.7751	2.6018	2.4072	-0.1733	2.5805		

MACH= 0.800  
ROLL= 90.00  
ALPP= 145.0  
CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDN	CN MSDNC	CN MSDNC	CN MSDNC	DEL CN MSM	CN MSM
136.00	6.9694	6.4108	6.2672	-0.5586	6.8258		
138.00	6.2404	5.7671	5.6979	-0.4823	6.1802		
140.00	5.5999	5.2186	5.1143	-0.3813	5.4956		
142.00	5.0971	4.7559	4.6587	-0.3412	5.0000		
144.00	4.7145	4.3893	4.2856	-0.3252	4.6108		
146.00	4.4383	4.1180	3.9306	-0.3196	4.2501		
148.00	3.8909	3.5944	3.5376	-0.2966	3.8342		
150.00	3.4833	3.2271	3.1535	-0.2562	3.4097		
152.00	3.1230	2.8821	2.8189	-0.2409	3.0598		

TABLE D- 9

MACH= 0.900  
 ROLL= 90.00  
 ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNOC	CN MSDNOC	DEL CN MSM	CN MSM
136.00	8.4760	7.9592	7.9541	-0.5168	8.4709
138.00	7.7989	7.2636	7.3358	-0.5353	7.8710
140.00	7.0224	6.5507	6.5977	-0.4717	7.0694
142.00	6.3304	5.8916	5.8901	-0.4388	6.3289
144.00	5.6553	5.2547	5.2294	-0.4006	5.6300
146.00	5.0537	4.7387	4.6966	-0.3145	5.0111
148.00	4.3677	4.0975	4.0962	-0.2701	4.3663
150.00	3.0767	3.6160	3.5898	-0.2607	3.8504
152.00	3.4241	3.1970	3.1779	-0.2271	3.4050

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MACH= 1.050  
 ROLL= 90.00  
 ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNOC	CN MSDNOC	DEL CN MSM	CN MSM
136.00	10.8303	10.2818	10.2447	-0.5484	10.7931
138.00	9.6321	9.3828	9.3752	-0.4493	9.8244
140.00	8.8923	8.4728	8.4491	-0.4195	8.8686
142.00	7.9371	7.5827	7.5776	-0.3544	7.9320
144.00	7.0607	6.7853	6.7124	-0.2753	6.9877
146.00	6.2952	6.0684	6.0136	-0.2268	6.2404
148.00	5.5788	5.3658	5.3512	-0.2131	5.5643
150.00	4.9392	4.7164	4.7070	-0.2229	4.9298
152.00	4.3555	4.1452	4.1529	-0.2103	4.3632



TABLE D- 10

MACH= 1.100  
 ROLL= 90.00  
 ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNOC	CN MS500C	DEL CN MSM	CN MSM
136.00	11.7658	11.2235	11.0911	-0.5423	11.6335
138.00	10.8513	10.3661	10.2135	-0.4853	10.6987
140.00	9.9355	9.4901	9.3253	-0.4454	9.7707
142.00	8.9639	8.5861	8.4139	-0.3778	8.7918
144.00	8.0065	7.7084	7.5283	-0.2981	7.8264
146.00	7.0944	6.8607	6.6972	-0.2337	6.9309
148.00	6.2314	6.0251	5.8890	-0.2063	6.0961
150.00	5.4330	5.2438	5.1499	-0.1892	5.3391
152.00	4.7176	4.5691	4.4618	-0.1465	4.6102

MACH= 1.200  
 ROLL= 90.00  
 ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNOC	CN MS500C	DEL CN MSM	CN MSM
136.00	12.0550	11.7226	11.6206	-0.3323	11.9529
138.00	11.1213	10.8594	10.7122	-0.2619	10.9741
140.00	10.1374	9.9627	9.7652	-0.1747	9.9399
142.00	9.2489	9.0966	8.8761	-0.1523	9.0284
144.00	8.3762	8.2392	8.0308	-0.1370	8.1678
146.00	7.5234	7.3902	7.2244	-0.1332	7.3576
148.00	6.6986	6.5674	6.4284	-0.1312	6.5596
150.00	5.8900	5.7778	5.6425	-0.1123	5.7548
152.00	5.1378	5.0284	4.9025	-0.1095	5.0119

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TABLE D- 11

MACH= 1.460  
 ROLL= 90.00  
 ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MOONSC	CN MSDNOC	CN MSOOC	DEL CN MSM	CN MSM
136.00	11.5980	11.2511	11.2437	-0.3469	11.5906
138.00	10.8966	10.5889	10.5497	-0.3078	10.8575
140.00	10.1159	9.8312	9.7836	-0.2847	10.0683
142.00	9.3276	9.0559	9.0010	-0.2717	9.2727
144.00	8.5754	8.3099	8.2443	-0.2655	8.5099
146.00	7.8139	7.5663	7.4624	-0.2475	7.7099
148.00	7.0352	6.8181	6.6806	-0.2171	6.8977
150.00	6.2893	6.0811	5.9055	-0.2082	6.1137
152.00	5.5706	5.3491	5.2072	-0.2215	5.4287

MACH= 0.600  
 ROLL= 0.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNOC	CM MSOOC	DEL CM MSM	CM MSM
136.00	0.9849	-1.2712	-2.3346	-2.2561	-0.0785
138.00	-0.1381	-1.3172	-2.2496	-1.1791	-1.0704
140.00	-0.6478	-1.1309	-1.9571	-0.4831	-1.4740
142.00	-0.5248	-0.8904	-1.6586	-0.3656	-1.2930
144.00	-0.2616	-0.6570	-1.4152	-0.3954	-1.0198
146.00	-0.0093	-0.4087	-1.1774	-0.3994	-0.7780
148.00	0.1372	-0.2504	-0.9309	-0.3876	-0.5433
150.00	0.2622	-0.0499	-0.7465	-0.3121	-0.4344
152.00	0.2163	-0.0222	-0.6835	-0.2385	-0.4451

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TABLE D- 12

MACH= 0.800  
 ROLL= 0.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNOC	CM MSDNOC	CM MS00C	DEL CM MSM	CM MSM
136.00	-1.4662	-2.6770	-3.4052	-3.4052	-1.2108	-2.1944
138.00	-1.2392	-2.6689	-3.1821	-3.1821	-1.4297	-1.7524
140.00	-1.0171	-2.4369	-2.8030	-2.8030	-1.4197	-1.3833
142.00	-0.8844	-1.9794	-2.3018	-2.3018	-1.0950	-1.2067
144.00	-0.6726	-1.4154	-1.7610	-1.7610	-0.7428	-1.0181
146.00	-0.2536	-0.9193	-1.2252	-1.2252	-0.6657	-0.5595
148.00	0.0709	-0.5663	-0.7306	-0.7306	-0.6372	-0.8934
150.00	0.3341	-0.1949	-0.4070	-0.4070	-0.5289	0.1219
152.00	0.3801	-0.0768	-0.2964	-0.2964	-0.4569	0.1685

MACH= 0.900  
 ROLL= 0.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNOC	CM MSDNOC	CM MS00C	DEL CM MSM	CM MSM
136.00	-2.4202	-3.3405	-3.6315	-3.6315	-0.9203	-2.7112
138.00	-1.9545	-2.8773	-2.7572	-2.7572	-0.9228	-1.8344
140.00	-1.6203	-2.3963	-2.1543	-2.1543	-0.7760	-1.3783
142.00	-1.3317	-2.0340	-1.8506	-1.8506	-0.7023	-1.1483
144.00	-0.9233	-1.7332	-1.4906	-1.4906	-0.8099	-0.6807
146.00	-0.4024	-1.2083	-1.0363	-1.0363	-0.8059	-0.2304
148.00	0.1317	-0.5781	-0.4881	-0.4881	-0.7098	0.2217
150.00	0.5393	-0.0028	-0.0295	-0.0295	-0.5421	0.5125
152.00	0.7982	0.3346	0.2833	0.2833	-0.4636	0.7470

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TABLE D- 13

MACH= 1.050  
 ROLL= 0.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSDNC	CM MSDNC	CM MSDNC	CM MSDNC	DEL CM MSM	CM MSM
136.00	-2.1676	-3.4757	-3.2802	-1.3081	-1.9721	-1.9721
138.00	-2.3319	-3.5517	-3.3938	-1.2190	-2.1740	-2.1740
140.00	-2.7035	-3.7540	-3.5359	-1.0504	-2.4855	-2.4855
142.00	-2.9942	-3.7785	-3.5293	-0.7843	-2.7450	-2.7450
144.00	-2.7860	-3.3077	-3.0168	-0.5197	-2.4971	-2.4971
146.00	-2.4419	-2.9109	-2.4530	-0.4690	-1.9840	-1.9840
148.00	-2.2070	-2.7356	-2.3664	-0.5297	-1.8368	-1.8368
150.00	-1.8267	-2.3736	-1.9440	-0.5469	-1.3972	-1.3972
152.00	-1.4237	-1.9362	-1.5502	-0.5125	-1.0377	-1.0377

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MACH= 1.100  
 ROLL= 0.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSDNC	CM MSDNC	CM MSDNC	CM MSDNC	DEL CM MSM	CM MSM
136.00	1.2694	-0.3889	-0.6610	-1.6584	0.9973	0.9973
138.00	1.0779	-0.6300	-1.0147	-1.7079	0.6932	0.6932
140.00	0.5582	-0.9848	-1.3483	-1.5530	0.2047	0.2047
142.00	-0.0013	-1.3583	-1.6518	-1.3570	-0.2948	-0.2948
144.00	-0.5611	-1.7029	-1.9239	-1.1417	-0.7821	-0.7821
146.00	-1.0614	-2.0610	-2.0995	-0.9995	-1.1000	-1.1000
148.00	-1.4805	-2.3987	-2.4875	-0.9181	-1.5693	-1.5693
150.00	-1.7830	-2.5583	-2.5520	-0.7733	-1.7767	-1.7767
152.00	-1.8683	-2.4391	-2.4042	-0.5708	-1.8334	-1.8334

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TABLE D- 14

MACH= 1.200  
ROLL= 0.00  
ALPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNOC	CM MSDNOC	DEL CM MSM	CM MSM
136.00	4.2098	2.7342	2.6205	-1.4755	4.0961
138.00	3.6991	2.4564	2.0708	-1.2427	3.3135
140.00	3.1514	2.0339	1.5420	-1.1176	2.6596
142.00	2.4301	1.5060	1.0083	-0.9241	1.9324
144.00	1.7346	0.9415	0.5519	-0.7931	1.3450
146.00	1.2186	0.4594	0.2977	-0.7592	1.0568
148.00	0.8094	0.1026	-0.1361	-0.7068	0.5707
150.00	0.4783	-0.1600	-0.3325	-0.6383	0.3058
152.00	0.1228	-0.4680	-0.9087	-0.5508	-0.3179

MACH= 1.460  
ROLL= 0.00  
ALPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNOC	CM MSDNOC	DEL CM MSM	CM MSM
136.00	5.2315	3.9630	4.5495	-1.2686	5.8181
138.00	4.9290	3.7938	4.1166	-1.1352	5.2519
140.00	4.4911	3.4701	3.5872	-1.0110	4.5981
142.00	3.9488	3.0381	2.9131	-0.9107	3.8238
144.00	3.2509	2.4680	2.3178	-0.7823	3.1002
146.00	2.6225	1.8894	1.7342	-0.7331	2.4673
148.00	2.1484	1.4150	1.2465	-0.7335	1.9800
150.00	2.0098	1.1447	0.9466	-0.8650	1.8116
152.00	1.8521	0.9064	0.6063	-0.9457	1.5521

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TABLE D- 15

MACH= 0.600  
ROLL= 45.00  
ALPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNOC	CM MSDNOC	CM MSDNOC	DEL CM MSM	CM MSM
136.00	-2.0395	-2.8364	-4.1024	-0.7969	-3.3055	-3.3055
138.00	-1.8672	-2.7396	-3.9343	-0.8724	-3.0618	-3.0618
140.00	-1.3904	-2.2863	-3.4080	-0.8960	-2.5120	-2.5120
142.00	-0.8547	-1.9378	-3.0136	-1.0831	-1.9305	-1.9305
144.00	-0.6337	-1.7384	-2.8023	-1.1047	-1.6976	-1.6976
146.00	-0.4445	-1.5745	-2.6107	-1.1301	-1.4806	-1.4806
148.00	-0.5408	-1.4503	-2.4289	-0.9095	-1.5194	-1.5194
150.00	-0.6613	-1.3972	-2.2652	-0.7359	-1.5293	-1.5293
152.00	-0.6661	-1.3304	-2.1117	-0.6643	-1.4473	-1.4473

MACH= 0.800  
ROLL= 45.00  
ALPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNOC	CM MSDNOC	CM MSDNOC	DEL CM MSM	CM MSM
136.00	-2.2958	-3.3422	-3.9952	-1.0463	-2.9489	-2.9489
138.00	-2.2160	-3.4112	-4.1323	-1.1953	-2.9371	-2.9371
140.00	-2.3701	-3.1091	-3.7155	-0.7391	-2.9764	-2.9764
142.00	-2.1865	-2.5360	-3.0547	-0.3475	-2.7072	-2.7072
144.00	-1.8852	-2.2723	-2.7350	-0.3872	-2.3479	-2.3479
146.00	-1.4855	-2.0091	-2.3935	-0.5236	-1.8699	-1.8699
148.00	-1.4005	-1.6217	-2.0933	-0.2212	-1.8721	-1.8721
150.00	-1.3225	-1.4432	-1.8749	-0.1207	-1.7541	-1.7541
152.00	-1.2632	-1.2791	-1.7315	-0.0159	-1.7156	-1.7156

TABLE D- 16

MACH= 0.900  
 ROLL= 45.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNCS	CM MSSOOC	DEL CM MSM	CM MSM
136.00	-3.7377	-3.7575	-3.5733	-0.0198	-3.5535
138.00	-3.2216	-3.5548	-3.4731	-0.3332	-3.1399
140.00	-2.7588	-3.3929	-3.3329	-0.6341	-2.6988
142.00	-2.3964	-3.0873	-2.9254	-0.6908	-2.2346
144.00	-2.0627	-2.6562	-2.5487	-0.5935	-1.9552
146.00	-1.7805	-2.2258	-2.2279	-0.4452	-1.7827
148.00	-1.5936	-1.8219	-1.8926	-0.2283	-1.6643
150.00	-1.2762	-1.3031	-1.5527	-0.0268	-1.5259
152.00	-0.8058	-1.0102	-1.2436	-0.1244	-1.1192

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MACH= 1.050  
 ROLL= 45.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNCS	CM MSSOOC	DEL CM MSM	CM MSM
136.00	-3.2250	-4.4877	-4.5532	-1.2627	-3.2905
138.00	-3.6148	-4.7166	-4.6495	-1.1017	-3.5478
140.00	-4.2660	-4.9605	-4.7775	-0.6945	-4.0830
142.00	-4.5901	-5.0087	-4.7217	-0.4185	-4.3032
144.00	-4.2933	-4.5202	-4.3037	-0.2269	-4.0760
146.00	-3.7956	-3.9451	-3.6477	-0.1494	-3.4983
148.00	-3.5094	-3.8599	-3.5745	-0.3505	-3.2240
150.00	-3.1501	-3.6259	-3.1976	-0.4758	-2.7217
152.00	-2.6437	-3.0889	-2.7272	-0.4452	-2.2820

TABLE D- 17

MACH= 1.100  
 ROLL= 45.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MDNSC	CM MSDNC	CM MS500C	DEL CM MSM	CM MSM
136.00	-0.0937	-1.5486	-2.0106	-1.5449	-0.4657
138.00	-0.3348	-1.9002	-2.4310	-1.5654	-0.8656
140.00	-0.8215	-2.1994	-2.7238	-1.3779	-1.3468
142.00	-1.3167	-2.4058	-2.8531	-1.0892	-1.7640
144.00	-1.6402	-2.5751	-3.1626	-0.9349	-2.2277
146.00	-2.2116	-2.8122	-3.3244	-0.6806	-2.7238
148.00	-2.8842	-3.1122	-3.4996	-0.2280	-3.2716
150.00	-3.0913	-3.3267	-3.6393	-0.2354	-3.4039
152.00	-3.0831	-3.2809	-3.6475	-0.1979	-3.4496

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MACH= 1.200  
 ROLL= 45.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MDNSC	CM MSDNC	CM MS500C	DEL CM MSM	CM MSM
136.00	2.6945	1.4127	1.6152	-1.2817	2.8978
138.00	2.0528	1.0170	1.0300	-1.0358	2.0658
140.00	1.5707	0.6899	0.5125	-0.8809	1.3933
142.00	1.2993	0.4599	0.1777	-0.8394	1.0171
144.00	0.9966	0.1222	-0.2024	-0.8744	0.6719
146.00	0.3955	-0.4183	-0.7404	-0.8139	0.0735
148.00	-0.2504	-0.9534	-1.0083	-0.7029	-0.3053
150.00	-0.6445	-1.3095	-1.2369	-0.6658	-0.5719
152.00	-1.0096	-1.5867	-1.5426	-0.5770	-0.9655



TABLE D- 18

MACH= 1.460  
ROLL= 45.00  
ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNCS	CM MS500C	DEL CM MSM	CM MSM
136.00	4.2352	3.2341	3.6291	-1.0011	4.6302
138.00	3.9612	3.0370	3.2640	-0.9233	4.1882
140.00	3.5632	2.6853	2.7631	-0.8779	3.6411
142.00	3.1021	2.2626	2.2028	-0.8395	3.0423
144.00	2.5635	1.8173	1.6412	-0.7461	2.3874
146.00	1.9244	1.3126	1.0277	-0.6118	1.6394
148.00	1.2810	0.7754	0.4580	-0.5064	0.9653
150.00	0.7333	0.2828	0.0117	-0.4505	0.4622
152.00	0.2317	-0.1646	-0.3824	-0.3963	0.0138

MACH= 0.600  
ROLL= 90.00  
ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNCS	CM MS500C	DEL CM MSM	CM MSM
136.00	-3.1134	-3.3871	-4.9298	-0.2738	-4.6560
138.00	-2.7092	-3.1084	-4.6260	-0.3992	-4.2268
140.00	-2.3708	-2.7818	-4.2405	-0.4110	-3.8295
142.00	-2.1330	-2.5847	-3.8940	-0.4517	-3.4423
144.00	-1.9550	-2.3807	-3.5537	-0.4257	-3.1279
146.00	-1.6431	-2.0584	-3.1544	-0.4153	-2.7392
148.00	-1.4402	-1.8116	-2.7880	-0.3714	-2.4166
150.00	-1.2791	-1.6223	-2.4716	-0.3432	-2.1284
152.00	-1.1169	-1.4116	-2.2163	-0.2947	-1.9216

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TABLE D- 19

MACH= 0.800  
 ROLL= 90.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNOC	CM MSOOC	DEL CM MSM	CM MSM
136.00	-3.0946	-4.4960	-5.1463	-1.4014	-3.7449
138.00	-3.4247	-4.5780	-5.0957	-1.1533	-3.9425
140.00	-3.5142	-4.2294	-4.7858	-0.7151	-4.0707
142.00	-3.1065	-3.7161	-4.1928	-0.6096	-3.5832
144.00	-2.5057	-3.0949	-3.5255	-0.5892	-2.9363
146.00	-1.9564	-2.4253	-2.9217	-0.4689	-2.4528
148.00	-1.7305	-2.1506	-2.5150	-0.4201	-2.0949
150.00	-1.4311	-1.8218	-2.1304	-0.3907	-1.7397
152.00	-1.2068	-1.5015	-1.7950	-0.2947	-1.5002

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MACH= 0.900  
 ROLL= 90.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDNOC	CM MSOOC	DEL CM MSM	CM MSM
136.00	-3.7675	-4.5325	-4.5130	-0.7650	-3.7480
138.00	-3.2807	-4.2620	-3.9273	-0.9813	-2.9460
140.00	-3.0580	-4.0410	-3.8373	-0.9830	-2.8543
142.00	-2.6737	-3.7462	-3.5448	-1.0725	-2.4724
144.00	-2.2996	-3.2597	-3.0763	-0.9591	-2.1192
146.00	-1.9923	-2.5331	-2.5558	-0.5400	-2.0150
148.00	-1.7221	-2.1892	-2.2225	-0.4671	-1.7554
150.00	-1.3341	-1.7010	-1.7624	-0.3669	-1.3955
152.00	-0.8987	-1.2400	-1.2529	-0.3413	-0.9116

TABLE D- 20

MACH= 1.050  
ROLL= 90.00  
ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDI SC	CM MSDOOC	DEL CM MSM	CM MSM
136.00	-3.0742	-4.1355	-3.8905	-1.0614	-2.8291
138.00	-3.5852	-4.4506	-4.1056	-0.8654	-3.2401
140.00	-3.9119	-4.6956	-4.3744	-0.7837	-3.5907
142.00	-4.2928	-4.8530	-4.5182	-0.5602	-3.9500
144.00	-4.0075	-4.6575	-4.5669	-0.5700	-3.9969
146.00	-3.4997	-4.1712	-3.9005	-0.6716	-3.2290
148.00	-3.2309	-3.7780	-3.2922	-0.5471	-2.7451
150.00	-2.9073	-3.4750	-2.9220	-0.5677	-2.3951
152.00	-2.5441	-3.0601	-2.7570	-0.5160	-2.2410

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MACH= 1.100  
ROLL= 90.00  
ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MOONSC	CM MSDI SC	CM MSDOOC	DEL CM MSM	CM MSM
136.00	0.5507	-1.0323	-1.0769	-1.5830	0.5061
138.00	0.0003	-1.3058	-1.5902	-1.3941	-0.1960
140.00	-0.4597	-1.7770	-2.0066	-1.3173	-0.6892
142.00	-1.0293	-2.1403	-2.3124	-1.1110	-1.2014
144.00	-1.5726	-2.4101	-2.5692	-0.8455	-1.7237
146.00	-2.0775	-2.7078	-2.7776	-0.6303	-2.1473
148.00	-2.4764	-2.9088	-2.9363	-0.5124	-2.4239
150.00	-2.7071	-3.0926	-2.9795	-0.3855	-2.5940
152.00	-2.8713	-3.0482	-3.1438	-0.1768	-2.9670

TABLE D- 21

MACH= 1.200  
ROLL= 90.00  
ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSDNC	CM MSDNC	CM MS500C	DEL CM MSM	CM MSM
136.00	3.2920	2.0813	2.3725	-1.2107	3.5832
138.00	2.6481	1.6963	1.6547	-0.9518	2.6065
140.00	1.8882	1.2203	1.0019	-0.6680	1.6699
142.00	1.4206	0.8844	0.5707	-0.5362	1.1068
144.00	0.9303	0.4595	0.1322	-0.4708	0.6029
146.00	0.4180	-0.0425	-0.2531	-0.4604	0.2073
148.00	0.0176	-0.4882	-0.5069	-0.5058	-0.0011
150.00	-0.3172	-0.8255	-0.7698	-0.5083	-0.2615
152.00	-0.6708	-1.0817	-1.0754	-0.4109	-0.6644

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MACH= 1.450  
ROLL= 90.00  
ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSDNC	CM MSDNC	CM MS500C	DEL CM MSM	CM MSM
136.00	4.6764	3.7141	4.0215	-0.9623	4.9838
138.00	4.4705	3.6187	3.8680	-0.8518	4.7198
140.00	4.0861	3.3382	3.5126	-0.7479	4.2606
142.00	3.6258	2.9550	3.0194	-0.6708	3.6902
144.00	3.0658	2.4764	2.3646	-0.5894	2.9540
146.00	2.4331	1.9166	1.6440	-0.5164	2.1604
148.00	1.7893	1.3080	0.9004	-0.4802	1.3806
150.00	1.2016	0.7035	0.2775	-0.4982	0.7756
152.00	0.6759	0.1581	-0.1484	-0.5178	0.3694

TABLE D- 22

MACH= 0.600  
 ROLL= 0.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSSOOC	DEL CY MSM	CY MSM
136.00	-3.9623	-5.0043	-5.1189	-1.0420	-4.0769
138.00	-4.3766	-4.5439	-4.5430	-0.1673	-4.3758
140.00	-4.1867	-3.9873	-3.9051	0.1994	-4.1045
142.00	-3.5636	-3.4270	-3.2389	0.1366	-3.3755
144.00	-2.6871	-2.8533	-2.7221	0.0278	-2.7500
146.00	-2.3337	-2.4104	-2.2727	-0.0768	-2.1959
148.00	-1.9925	-2.0144	-1.9767	-0.0219	-1.9548
150.00	-1.6236	-1.7156	-1.6714	-0.0920	-1.5794
152.00	-1.2113	-1.3039	-1.2643	-0.0926	-1.1717

ORIGINAL PAGE IS  
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MACH= 0.800  
 ROLL= 0.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSSOOC	DEL CY MSM	CY MSM
136.00	-3.3919	-3.0853	-3.8296	0.3066	-4.1363
138.00	-3.3901	-3.1225	-3.8539	0.2676	-4.1215
140.00	-3.3131	-3.1208	-3.8201	0.1922	-4.0123
142.00	-3.1498	-3.0642	-3.6990	0.0856	-3.7845
144.00	-2.8873	-2.8184	-3.3013	0.0689	-3.3701
146.00	-2.5471	-2.5950	-2.9097	-0.0479	-2.8619
148.00	-2.2970	-2.4624	-2.6743	-0.1654	-2.5089
150.00	-1.9237	-2.1844	-2.2475	-0.2607	-1.9868
152.00	-1.5109	-1.7720	-1.7178	-0.2611	-1.4568

TABLE D- 23

MACH= 0.900  
ROLL= 0.00  
ALPP= 145.0

CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MS500C	DEL CY MSM	CY MSM
136.00	-2.0333	-1.9954	-2.4203	0.0380	-2.4582
138.00	-2.1369	-2.2581	-2.9448	-0.1213	-2.8235
140.00	-2.2309	-2.5237	-3.0774	-0.2928	-2.7845
142.00	-2.2543	-2.4035	-2.0217	-0.2292	-2.5925
144.00	-2.2043	-2.3182	-2.5413	-0.1139	-2.4274
146.00	-2.1596	-2.1839	-2.3001	-0.0244	-2.2757
148.00	-2.0506	-2.0527	-2.2477	-0.0022	-2.2455
150.00	-1.7699	-1.8520	-1.9837	-0.0821	-1.9016
152.00	-1.4590	-1.5401	-1.6357	-0.0811	-1.5545

ORIGINAL PAGE IS  
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MACH= 1.050  
ROLL= 0.00  
ALPP= 145.0

CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MS500C	DEL CY MSM	CY MSM
136.00	-1.4704	-1.2240	-1.7002	0.2465	-1.9467
138.00	-1.4268	-1.2327	-1.6663	0.1942	-1.8604
140.00	-1.4112	-1.2938	-1.6886	0.1174	-1.8060
142.00	-1.3440	-1.3218	-1.6385	0.0222	-1.6606
144.00	-1.2402	-1.2475	-1.4282	-0.0073	-1.4209
146.00	-1.1777	-1.1964	-1.4351	-0.0136	-1.4165
148.00	-1.1362	-1.1543	-1.3177	-0.0181	-1.2996
150.00	-1.0085	-1.0041	-1.1498	0.0044	-1.1542
152.00	-0.8312	-0.8765	-0.9970	-0.0453	-0.9517

TABLE D- 24

MACH= 1.100  
ROLL= 0.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSOOC	DEL CY MSM	CY MSM
136.00	-1.4996	-1.2329	-1.6688	0.2668	-1.9356
138.00	-1.4586	-1.1521	-1.5456	0.3065	-1.8521
140.00	-1.3832	-1.1180	-1.4627	0.2652	-1.7279
142.00	-1.2534	-1.0852	-1.3907	0.1682	-1.5589
144.00	-1.1305	-1.0337	-1.2887	0.0968	-1.3855
146.00	-1.1063	-1.0723	-1.2723	0.0340	-1.3062
148.00	-1.1622	-1.1617	-1.3356	0.0005	-1.3361
150.00	-1.0851	-1.0518	-1.1757	0.0333	-1.2090
152.00	-0.8044	-0.7356	-0.6605	0.0688	-0.7293

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MACH= 1.200  
ROLL= 0.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSOOC	DEL CY MSM	CY MSM
136.00	-1.3805	-1.3267	-1.6884	0.0538	-1.7422
138.00	-1.3870	-1.2154	-1.5558	0.1716	-1.7274
140.00	-1.3344	-1.0499	-1.3794	0.2845	-1.6639
142.00	-1.2338	-0.9445	-1.2026	0.2893	-1.4920
144.00	-1.1210	-0.9078	-1.1161	0.2132	-1.3293
146.00	-1.0838	-1.0031	-1.1794	0.0007	-1.2601
148.00	-1.1523	-1.1780	-1.3605	-0.0257	-1.3348
150.00	-1.2607	-1.3256	-1.5651	-0.0649	-1.5002
152.00	-1.1353	-1.1771	-1.1059	-0.0418	-1.0641

TABLE D- 25

MACH= 1.460  
ROLL= 0.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSSOOC	DEL CY MSM	CY MSM
136.00	-0.7321	-0.7526	-1.0271	-0.0205	-1.0066
138.00	-0.7499	-0.7720	-1.0311	-0.0220	-1.0090
140.00	-0.7456	-0.7548	-0.9933	-0.0092	-0.9841
142.00	-0.7335	-0.7220	-0.9449	0.0115	-0.9564
144.00	-0.7022	-0.6853	-0.9092	0.0168	-0.9261
146.00	-0.6592	-0.6806	-0.9117	-0.0214	-0.8903
148.00	-0.6521	-0.7623	-1.0324	-0.1102	-0.9222
150.00	-0.7453	-0.9883	-1.2366	-0.2430	-0.9937
152.00	-0.9096	-1.1853	-1.1312	-0.2757	-0.8555

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MACH= 0.600  
ROLL= 45.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSSOOC	DEL CY MSM	CY MSM
136.00	-1.9232	-2.6071	-2.6038	-0.6840	-1.9198
138.00	-1.6762	-2.5194	-2.4551	-0.8432	-1.6119
140.00	-1.3056	-2.3666	-2.3445	-1.0610	-1.2836
142.00	-1.0882	-2.3151	-2.3272	-1.2268	-1.1003
144.00	-0.9203	-2.0799	-2.0920	-1.1596	-0.9324
146.00	-0.8276	-1.5984	-1.6809	-0.8707	-0.8101
148.00	-0.8495	-1.4221	-1.3478	-0.5726	-0.7752
150.00	-0.8870	-1.2219	-1.1154	-0.3349	-0.7806
152.00	-0.8980	-1.0660	-0.9578	-0.1680	-0.7898



TABLE D- 26

MACH= 0.800  
 ROLL= 45.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSOOC	DEL CY MSM	CY MSM
136.00	0.2518	-1.3803	-1.0572	-1.6321	0.5750
138.00	0.0423	-1.5745	-1.4422	-1.6168	0.1745
140.00	-0.0261	-1.6873	-1.5468	-1.6612	0.1143
142.00	-0.0343	-1.6573	-1.6243	-1.6230	-0.0013
144.00	-0.0773	-1.5541	-1.5256	-1.4768	-0.0487
146.00	-0.0777	-1.2805	-1.3474	-1.2028	-0.1447
148.00	-0.0900	-1.0719	-1.1726	-0.9818	-0.1908
150.00	-0.0934	-0.9832	-0.9761	-0.8898	-0.0863
152.00	0.0581	-0.8848	-0.8098	-0.9429	0.1331

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MACH= 0.900  
 ROLL= 45.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSOOC	DEL CY MSM	CY MSM
136.00	0.8392	-0.1573	-0.0489	-0.9966	0.9477
138.00	0.7173	-0.2512	-0.1748	-0.9685	0.7937
140.00	0.5314	-0.2872	-0.3521	-0.8166	0.4666
142.00	0.3463	-0.6486	-0.7570	-0.9949	0.2380
144.00	0.1780	-0.8058	-0.8404	-0.9838	0.1355
146.00	0.1565	-0.8166	-0.7750	-0.9731	0.1981
148.00	0.2019	-0.6595	-0.7497	-0.8614	0.1116
150.00	0.1612	-0.8202	-0.7679	-0.9815	0.2136
152.00	0.0991	-0.6030	-0.7488	-0.9021	0.1533

TABLE D- 27

MACH= 1.050  
 ROLL= 45.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSSOOC	DEL CY MSM	CY MSM
136.00	1.3036	1.0832	1.2285	-0.2203	1.4489
138.00	1.2182	0.9477	1.0503	-0.2705	1.3209
140.00	1.0236	0.6647	0.7015	-0.3589	1.0604
142.00	0.9022	0.4365	0.3839	-0.3656	0.7495
144.00	0.6341	0.1942	0.1942	-0.4399	0.6341
146.00	0.5568	-0.0801	0.0242	-0.6369	0.6611
148.00	0.5156	-0.1771	0.2034	-0.6927	0.8962
150.00	0.3483	-0.1837	0.0155	-0.5320	0.5475
152.00	0.0436	-0.4603	-0.4279	-0.5040	0.0761

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.100  
 ROLL= 45.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSSOOC	DEL CY MSM	CY MSM
136.00	1.2739	1.0076	1.1204	-0.2664	1.3867
138.00	1.1876	0.9570	1.0616	-0.2306	1.2922
140.00	1.0440	0.7901	0.9015	-0.2539	1.1554
142.00	0.9775	0.5356	0.5970	-0.3418	0.9389
144.00	0.6913	0.3078	0.3919	-0.3835	0.7753
146.00	0.5970	0.1983	0.3382	-0.3986	0.7369
148.00	0.4738	0.1415	0.1070	-0.3323	0.4393
150.00	0.2580	0.0452	0.1283	-0.2128	0.3411
152.00	0.2159	-0.0878	-0.0805	-0.3037	0.2232

TABLE D- 28

MACH= 1.200  
 ROLL= 45.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNCS	CY MS500C	DEL CY MSM	CY MSM
136.00	1.0815	0.8490	0.8400	-0.2324	1.0724
138.00	1.0064	0.7647	0.7431	-0.2416	0.9947
140.00	0.8942	0.6578	0.6295	-0.2364	0.8659
142.00	0.7595	0.4672	0.4494	-0.2923	0.7416
144.00	0.6775	0.3293	0.3449	-0.3482	0.6931
146.00	0.6341	0.2981	0.3989	-0.3359	0.7348
148.00	0.5449	0.2428	0.2748	-0.3021	0.5370
150.00	0.3943	0.1447	0.2395	-0.2496	0.4891
152.00	0.2871	0.0972	0.1423	-0.1900	0.3323

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.450  
 ROLL= 45.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNCS	CY MS500C	DEL CY MSM	CY MSM
136.00	1.0261	0.9385	0.9297	-0.0876	1.0173
138.00	0.9424	0.8345	0.8148	-0.1079	0.9227
140.00	0.8722	0.7419	0.7146	-0.1303	0.8449
142.00	0.8085	0.6712	0.6346	-0.1374	0.7720
144.00	0.7411	0.6219	0.5919	-0.1191	0.7110
146.00	0.6670	0.5675	0.5343	-0.0994	0.6710
148.00	0.6034	0.5218	0.4917	-0.0816	0.6210
150.00	0.5706	0.5134	0.5533	-0.0572	0.5710
152.00	0.5707	0.5244	0.5741	-0.0462	0.6203

TABLE D- 29

MACH= 0.600  
 ROLL= 90.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSDNC	CY MSDNC	CY MS500C	DEL CY MSM	CY MSM
136.00	-0.1612	-0.0425	0.0737	0.1188	-0.0450
138.00	-0.2335	-0.0525	0.0483	0.1811	-0.1328
140.00	-0.2331	-0.1011	-0.0034	0.1320	-0.1354
142.00	-0.1618	-0.1081	-0.0257	0.0937	-0.0795
144.00	-0.0776	-0.1141	-0.0603	-0.0366	-0.0237
146.00	-0.1075	-0.2448	-0.1502	-0.1373	-0.0129
148.00	-0.0044	-0.2097	-0.2039	-0.1253	-0.0786
150.00	-0.1326	-0.2623	-0.2541	-0.1297	-0.1244
152.00	-0.1895	-0.3243	-0.2954	-0.1348	-0.1606

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.800  
 ROLL= 90.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSDNC	CY MSDNC	CY MS500C	DEL CY MSM	CY MSM
136.00	0.3362	0.2669	0.2603	-0.0653	0.3296
138.00	0.2780	0.2661	0.2322	-0.0127	0.2450
140.00	0.2450	0.2772	0.2827	0.0322	0.2505
142.00	0.2282	0.3063	0.3080	0.0781	0.2299
144.00	0.1203	0.1982	0.1311	0.0779	0.0533
146.00	-0.0214	-0.1034	-0.0883	-0.0610	-0.0063
148.00	0.0007	-0.0151	-0.1521	-0.0157	-0.1364
150.00	-0.0073	-0.0542	-0.1662	-0.0459	-0.1192
152.00	-0.0045	-0.1702	-0.2270	-0.0858	-0.1412

TABLE D- 30

MACH= 0.900  
 ROLL= 90.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSSOOC	DEL CY MSM	CY MSM
136.00	0.0498	-0.0342	0.0922	-0.0840	0.1763
138.00	0.2250	0.1951	0.5093	-0.0299	0.5394
140.00	0.4002	0.4695	0.4634	0.0692	0.3942
142.00	0.3529	0.5077	0.4966	0.1548	0.3419
144.00	0.3380	0.4589	0.3733	0.1209	0.2524
146.00	0.3663	0.3574	0.2033	-0.0089	0.2122
148.00	0.1813	0.2345	0.1421	0.0533	0.0888
150.00	0.1668	0.1893	0.1302	0.0225	0.1077
152.00	0.1341	0.0915	0.0019	-0.0426	0.0444

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.050  
 ROLL= 90.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MSSOOC	DEL CY MSM	CY MSM
136.00	0.3209	-0.0289	-0.0775	-0.0499	-0.0276
138.00	0.0330	-0.0289	-0.0546	-0.0619	0.0073
140.00	0.0412	-0.0226	-0.0299	-0.0638	0.0339
142.00	0.0553	0.0016	-0.0062	-0.0537	0.0475
144.00	0.0836	0.0667	-0.0012	-0.0169	0.0157
146.00	0.0968	0.1023	-0.1282	0.0055	-0.1338
148.00	0.0241	0.0029	-0.2218	-0.0212	-0.2006
150.00	-0.0735	-0.1157	-0.2503	-0.0422	-0.2081
152.00	0.0770	0.0504	0.0576	-0.0266	0.0941

TABLE D- 31

MACH= 1.100  
 POLL= 90.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MS500C	DEL CY MSM	CY MSM
136.00	0.0862	0.0628	-0.0637	-0.0234	-0.0403
138.00	0.0833	0.0210	-0.0859	-0.0623	-0.0236
140.00	0.0710	-0.0121	-0.0868	-0.0831	-0.0837
142.00	0.0627	0.0073	-0.0335	-0.0554	0.0219
144.00	0.0767	0.0418	0.0623	-0.0349	0.0972
146.00	0.1193	0.1073	0.0257	-0.0120	0.0377
148.00	0.1681	0.1925	-0.0227	0.0244	-0.0471
150.00	0.1862	0.2074	0.1037	0.0213	0.0924
152.00	0.1684	0.1647	0.0945	-0.0038	0.0983

MACH= 1.200  
 ROLL= 90.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MOONSC	CY MSDNOC	CY MS500C	DEL CY MSM	CY MSM
136.00	0.0259	0.0496	-0.0601	0.0236	-0.0837
138.00	0.0457	0.0463	-0.0607	0.0007	-0.0614
140.00	0.0503	0.0092	-0.0825	-0.0411	-0.0414
142.00	0.0271	-0.0696	-0.1310	-0.0967	-0.0343
144.00	0.0380	-0.0289	-0.0959	-0.0669	-0.0290
146.00	0.0748	0.0728	0.0293	-0.0020	0.0313
148.00	0.0821	0.1035	-0.0946	0.0214	-0.1159
150.00	0.0832	0.1112	0.0327	0.0200	0.0047
152.00	0.1411	0.1058	0.1150	0.0447	0.0703

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TABLE D- 32

MACH= 1.460  
 ROLL= 90.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MDSHC	CY MDSHC	CY MSSOOC	DEL CY MSH	CY MSH
136.00	0.1574	0.1716	0.0773	0.0142	0.0631
138.00	0.1466	0.1625	0.0658	0.0159	0.0498
140.00	0.1391	0.1348	0.0368	-0.0043	0.0411
142.00	0.1308	0.1109	0.0146	-0.0199	0.0345
144.00	0.1145	0.1074	0.0247	-0.0072	0.0319
146.00	0.1031	0.1325	0.0642	0.0294	0.0348
148.00	0.1368	0.2246	0.1911	0.0878	0.1033
150.00	0.2253	0.3299	0.2299	0.1046	0.1253
152.00	0.3123	0.3360	0.2845	0.0237	0.2608

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.600  
 ROLL= 0.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MDSHC	CYM MDSHC	CYM MSSOOC	DEL CYM MSH	CYM MSH
136.00	0.3132	-3.2952	-2.6286	-3.6084	0.9798
138.00	-1.6778	-2.7305	-2.2096	-1.0528	-1.1569
140.00	-2.7234	-2.3055	-1.0037	0.3379	-2.1416
142.00	-2.4827	-2.3077	-1.6843	0.1750	-1.8593
144.00	-1.9714	-2.1264	-1.4146	-0.1550	-1.2596
146.00	-1.5205	-1.8633	-1.3473	-0.3428	-1.0045
148.00	-0.9704	-1.6176	-1.0814	-0.6471	-0.4342
150.00	-0.5750	-0.0476	-0.6993	-0.2716	-0.4276
152.00	-0.7705	-0.6092	-0.6925	-0.0307	-0.6618

TABLE D- 33

MACH= 0.800  
 ROLL= 0.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSOOC	DEL CYM MSM	CYM MSM
136.00	-1.4545	-1.0086	-1.3841	0.4459	-1.8300
138.00	-1.4056	-0.8895	-1.1578	0.5161	-1.6739
140.00	-1.4224	-0.8519	-1.0089	0.5705	-1.5795
142.00	-1.4930	-0.9066	-0.8491	0.5864	-1.4356
144.00	-1.3233	-0.6903	-0.5799	0.6330	-1.2129
146.00	-0.9465	-0.5552	-0.6334	0.3913	-1.0247
148.00	-0.3677	-0.3455	-0.5131	0.0222	-0.5353
150.00	-0.2159	-0.4421	-0.4895	-0.2262	-0.2633
152.00	-0.4892	-0.8219	-0.6520	-0.3327	-0.3193

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.900  
 ROLL= 0.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSOOC	DEL CYM MSM	CYM MSM
136.00	-1.3232	-1.5003	-1.2644	-0.1771	-1.0873
138.00	-1.3285	-1.3081	-1.4651	0.0203	-1.4854
140.00	-1.2588	-1.0368	-1.6047	0.2220	-1.8267
142.00	-1.2344	-0.9706	-1.3622	0.2638	-1.6259
144.00	-1.2505	-1.0024	-0.9210	0.2481	-1.1692
146.00	-1.0695	-0.6907	-0.6168	0.3789	-0.9957
148.00	-0.6417	-0.3005	-0.4182	0.3411	-0.7593
150.00	-0.3427	-0.2976	-0.4373	0.0451	-0.5323
152.00	-0.3962	-0.5679	-0.7054	-0.1718	-0.5337



TABLE D- 34

MACH= 1.050  
ROLL= 0.00  
ALPP= 145.0

CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSOOC	DEL CYM MSM	CYM MSM
136.00	-0.4623	-0.3255	-0.1788	0.1368	-0.3156
138.00	-0.4716	-0.3289	-0.2142	0.1427	-0.3569
140.00	-0.4667	-0.4312	-0.3496	0.0355	-0.3051
142.00	-0.4589	-0.5693	-0.4850	-0.1103	-0.3747
144.00	-0.6067	-0.7066	-0.7490	-0.0999	-0.6491
146.00	-0.7634	-0.8817	-0.9598	-0.1183	-0.8415
148.00	-0.7821	-0.9056	-0.9270	-0.1235	-0.8035
150.00	-0.6890	-0.6128	-0.5624	0.0762	-0.6386
152.00	-0.4265	-0.3727	-0.3954	0.0538	-0.4492

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 1.100  
ROLL= 0.00  
ALPP= 145.0

CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSOOC	DEL CYM MSM	CYM MSM
136.00	-0.5652	-0.2439	-0.1794	0.3212	-0.5065
138.00	-0.6134	-0.1509	-0.0307	0.4625	-0.4932
140.00	-0.6739	-0.1864	-0.0010	0.4875	-0.5685
142.00	-0.5953	-0.3705	-0.2147	0.2247	-0.4394
144.00	-0.6730	-0.6506	-0.4774	0.0223	-0.4997
146.00	-0.5281	-0.6912	-0.6431	-0.1631	-0.4801
148.00	-0.2709	-0.6513	-0.5987	-0.3805	-0.2182
150.00	-0.3805	-0.6366	-0.6415	-0.2560	-0.3855
152.00	-0.6162	-0.3659	-0.2122	0.2503	-0.4675

TABLE D- 35

MACH= 1.200  
ROLL= 0.00  
ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSDNC	CYM MSDNC	CYM MS500C	DEL CYM MSM	CYM MSM
136.00	-0.6193	-0.5951	-0.6564	0.0242	-0.6806
138.00	-0.6206	-0.3686	-0.4105	0.2520	-0.6625
140.00	-0.7654	-0.1946	-0.2522	0.5708	-0.8229
142.00	-0.8113	-0.1656	-0.3335	0.6457	-0.9796
144.00	-0.7896	-0.3463	-0.5923	0.4433	-1.0355
146.00	-0.7021	-0.4590	-0.6778	0.2431	-0.9209
148.00	-0.4005	-0.5216	-0.6906	-0.1211	-0.5695
150.00	-0.1240	-0.5797	-0.7632	-0.4556	-0.3076
152.00	-0.4506	-0.5689	-0.5496	-0.1182	-0.4314

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 1.460  
ROLL= 0.00  
ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSDNC	CYM MSDNC	CYM MS500C	DEL CYM MSM	CYM MSM
136.00	-0.9296	-0.9901	-1.0908	-0.0604	-1.0303
138.00	-0.8772	-0.9540	-1.0444	-0.0768	-0.9676
140.00	-0.8125	-0.8540	-0.9535	-0.0414	-0.9121
142.00	-0.8082	-0.7818	-0.8390	0.0264	-0.8654
144.00	-0.7568	-0.7091	-0.8377	0.0477	-0.8854
146.00	-0.6664	-0.7423	-0.9103	-0.0759	-0.8345
148.00	-0.4660	-0.8474	-1.0040	-0.3814	-0.6225
150.00	0.0116	-0.9085	-0.9789	-0.9200	-0.0589
152.00	0.2244	-0.9021	-0.7105	-1.1265	0.4160

TABLE D- 36

MACH= 0.600  
 ROLL= 45.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSDOOC	DEL CYM MSM	CYM MSM
136.00	-2.1945	-3.4149	-3.4403	-1.2205	-2.2199
138.00	-1.7271	-3.2316	-3.4141	-1.5045	-1.9096
140.00	-1.2924	-3.4277	-3.5634	-2.1354	-1.4260
142.00	-0.3786	-3.6028	-3.5819	-3.2242	-0.3578
144.00	0.3497	-2.9052	-2.9699	-3.2550	0.2851
146.00	0.3908	-2.3893	-2.1961	-2.7800	0.5839
148.00	0.0203	-1.8259	-1.3538	-1.8462	6.4924
150.00	-0.3955	-1.3147	-0.8190	-0.9191	0.1001
152.00	-0.9227	-1.3368	-0.7458	-0.4141	-0.3318

ORIGINAL PAGE 19  
 OF POOR QUALITY

MACH= 0.800  
 ROLL= 45.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSDOOC	DEL CYM MSM	CYM MSM
136.00	-1.1131	-2.0872	-1.4927	-0.9741	-0.5187
138.00	-0.9807	-1.5726	-1.2923	-0.5919	-0.7004
140.00	-1.2332	-1.7314	-1.3059	-0.4982	-0.8077
142.00	-1.0595	-2.3634	-2.3194	-1.3039	-1.0155
144.00	-0.5302	-2.1462	-2.0250	-1.6160	-0.4090
146.00	0.0316	-1.5858	-1.5902	-1.6174	0.0272
148.00	0.1320	-1.0006	-0.9882	-1.1326	0.1444
150.00	0.0445	-0.7364	-0.5804	-0.7810	0.2035
152.00	-0.0761	-0.8395	-0.4241	-0.7635	0.3393

TABLE D- 37

MACH= 0.900  
ROLL= 45.00  
ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSDNOC	DEL CYM MSM	CYM MSM
136.00	-0.5889	-1.2929	-1.2708	-0.7041	-0.5668
138.00	-0.5663	-0.8672	-0.5844	-0.3010	-0.2835
140.00	-0.4369	-0.4118	-0.2409	0.0251	-0.2660
142.00	-0.4519	-0.9172	-0.9557	-0.4653	-0.4903
144.00	-0.2410	-1.0697	-0.9425	-0.8287	-0.1138
146.00	0.1053	-1.0598	-1.0336	-1.1650	0.1314
148.00	0.0427	-0.8648	-0.7961	-0.9075	0.1114
150.00	0.1002	-0.7358	-0.5130	-0.8359	0.3230
152.00	-0.0658	-0.7924	-0.3979	-0.7267	0.3287

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 1.050  
ROLL= 45.00  
ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSSOOC	DEL CYM MSM	CYM MSM
136.00	1.5481	1.3696	1.6496	-0.1785	1.8280
138.00	1.3301	1.2470	1.4395	-0.0831	1.5226
140.00	1.0748	0.7138	0.8834	-0.3609	1.2443
142.00	0.5722	0.2473	0.3757	-0.3249	0.7005
144.00	-0.0224	-0.3147	0.0184	-0.2923	0.3107
146.00	-0.4366	-0.7503	-0.4598	-0.3137	-0.1460
148.00	0.3490	-0.5070	0.1102	-0.1580	0.2683
150.00	0.2368	-0.2157	0.0051	-0.4524	0.4575
152.00	0.2818	-0.2617	-0.0210	-0.5435	0.5225

TABLE D- 38

MACH= 1.100  
 ROLL= 45.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSDNC	CYM MSOOC	DEL CYM MSM	CYM MSM
136.00	1.8762	1.4509	1.4509	1.7905	-0.4253	2.2158
138.00	1.7060	1.4252	1.4252	1.7350	-0.2808	2.0158
140.00	1.6049	1.2248	1.2248	1.5441	-0.3801	1.9243
142.00	1.6067	0.8955	0.8955	1.1759	-0.7112	1.8871
144.00	1.5104	0.4024	0.4024	0.6625	-1.1080	1.7705
146.00	1.0744	-0.0303	-0.0303	-0.0585	-1.1047	1.0462
148.00	0.6194	-0.0485	-0.0485	-0.0033	-0.6679	0.6646
150.00	0.6710	0.1365	0.1365	0.3061	-0.5345	0.8406
152.00	0.9447	0.0094	0.0094	0.1796	-0.9353	1.1149

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MACH= 1.200  
 ROLL= 45.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSDNC	CYM MSOOC	DEL CYM MSM	CYM MSM
136.00	1.9006	1.4154	1.4154	1.5968	-0.4852	2.0839
138.00	1.8709	1.3508	1.3508	1.5092	-0.5200	2.0292
140.00	1.7804	1.2605	1.2605	1.4224	-0.5198	1.9423
142.00	1.7371	0.9367	0.9367	1.1862	-0.8004	1.9866
144.00	1.5562	0.4074	0.4074	0.7788	-1.1489	1.9277
146.00	1.2823	0.0589	0.0589	0.2924	-1.2234	1.5159
148.00	1.0464	-0.0023	-0.0023	0.2481	-1.0488	1.2069
150.00	0.7538	0.0638	0.0638	0.4568	-0.7300	1.1868
152.00	0.6650	0.1819	0.1819	0.4175	-0.4830	0.9006

TABLE D- 39

MACH= 1.460  
ROLL= 45.00  
ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSOOC	DEL CYM MSM	CYM MSM
136.00	1.2073	1.1513	1.2339	-0.0560	1.2899
138.00	1.2017	1.0926	1.1760	-0.1091	1.2852
140.00	1.2075	0.9976	1.1129	-0.2099	1.3228
142.00	1.2324	0.9567	1.0342	-0.2757	1.3099
144.00	1.1819	0.9572	1.0166	-0.2247	1.2413
146.00	1.0713	0.8946	0.9686	-0.1767	1.1454
148.00	0.8661	0.7262	0.8074	-0.1399	0.9473
150.00	0.5695	0.5637	0.7107	-0.0059	0.7165
152.00	0.3636	0.5453	0.7760	0.1817	0.5943

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MACH= 0.600  
ROLL= 90.00  
ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSOOC	DEL CYM MSM	CYM MSM
136.00	0.5578	0.8469	1.1618	0.2891	0.8728
138.00	0.4694	0.7295	1.3512	0.2602	1.0911
140.00	0.2995	0.6970	1.2445	0.3975	0.8469
142.00	0.2336	0.6133	1.1959	0.3797	0.8162
144.00	0.3252	0.6823	1.0684	0.3571	0.7113
146.00	0.4556	0.4120	0.7525	-0.0436	0.7961
148.00	0.6647	0.6156	0.6778	-0.0491	0.7269
150.00	0.7546	0.6122	0.6617	-0.1424	0.8841
152.00	0.7453	0.4498	0.5618	-0.2955	0.8572

TABLE D- 40

MACH= 0.800  
 ROLL= 90.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNC	CYM MSDNC	CYM MSDNC	DEL CYM MSM	CYM MSM
136.00	-0.3228	-0.2340	-0.3433	-0.0205	-0.2135	
138.00	-0.1885	0.1176	-0.1791	0.0094	0.1082	
140.00	-0.0941	0.3599	0.1019	0.1960	0.1639	
142.00	-0.1296	0.6297	0.2958	0.4253	0.2044	
144.00	0.0451	0.7367	0.5233	0.4782	0.2585	
146.00	0.3317	0.4846	0.0497	-0.2020	0.7666	
148.00	0.4963	0.5342	0.6579	0.1616	0.3726	
150.00	0.6871	0.5602	0.6273	-0.0598	0.6200	
152.00	0.8358	0.5226	0.5436	-0.2923	0.8148	

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MACH= 0.900  
 ROLL= 90.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MOONSC	CYM MSDNOC	CYM MSDNC	DEL CYM MSM	CYM MSM
136.00	0.0449	0.1878	-0.0103	-0.0552	0.2431
138.00	-0.0560	0.0781	-0.0029	0.0530	0.0251
140.00	-0.0143	0.4108	0.2225	0.2368	0.1741
142.00	0.0068	0.6793	0.5589	0.5521	0.1272
144.00	-0.0610	0.6833	0.4949	0.5560	0.1274
146.00	-0.0183	0.2524	0.1555	0.1738	0.0786
148.00	0.1256	0.4667	0.6504	0.5248	-0.0581
150.00	0.4225	0.6351	0.5951	0.1726	0.4625
152.00	0.9100	0.6685	0.6977	-0.2123	0.8808

TABLE D- 41

MACH= 1.050  
ROLL= 90.00  
ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSDNC	CYM MSDNC	CYM MSDNC	CYM MSDNC	DEL CYM MSM	CYM MSM
136.00	0.3262	0.2328	0.3024	-0.0933	-0.0933	0.3957
138.00	0.2658	0.1955	0.2945	-0.0703	-0.0703	0.3648
140.00	0.2655	0.2056	0.2931	-0.0599	-0.0599	0.3530
142.00	0.2541	0.2254	0.3471	-0.0287	-0.0287	0.3758
144.00	0.1929	0.2741	0.4998	0.0812	0.0812	0.4185
146.00	0.1404	0.2604	0.3668	0.1200	0.1200	0.2468
148.00	0.1346	0.1285	0.2053	-0.0062	-0.0062	0.2115
150.00	0.0102	0.0545	0.1232	0.0443	0.0443	0.0789
152.00	-0.3194	0.0871	0.2724	0.4066	0.4066	-0.1342

MACH= 1.100  
ROLL= 90.00  
ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSDNC	CYM MSDNC	CYM MSDNC	CYM MSDNC	DEL CYM MSM	CYM MSM
136.00	0.2775	0.3406	0.3558	0.0631	0.0631	0.327
138.00	0.2932	0.2673	0.3040	-0.0259	-0.0259	0.3299
140.00	0.4097	0.3078	0.3048	-0.1019	-0.1019	0.4067
142.00	0.4207	0.4053	0.3695	-0.0154	-0.0154	0.3849
144.00	0.3499	0.3858	0.4189	0.0359	0.0359	0.3830
146.00	0.1849	0.2694	0.2456	0.0645	0.0645	0.1612
148.00	-0.0608	0.1816	0.2196	0.2424	0.2424	-0.0228
150.00	-0.2218	0.0924	0.1641	0.3142	0.3142	-0.1501
152.00	-0.1576	-0.0598	0.3340	0.0978	0.0978	0.2362

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TABLE D- 42

MACH= 1.200  
 ROLL= 90.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSDNC	CYM MSDNC	CYM MSDNC	CYM MSDNC	DEL CYM MSM	CYM MSM
136.00	0.2182	0.4505	0.4938	0.2323	0.2615	0.2615
138.00	0.2297	0.3428	0.3703	0.1131	0.2572	0.2572
140.00	0.3327	0.2662	0.3172	-0.0665	0.3838	0.3838
142.00	0.4756	0.2110	0.3474	-0.2646	0.6119	0.6119
144.00	0.3966	0.2335	0.3946	-0.1631	0.5577	0.5577
146.00	0.2293	0.2236	0.3388	-0.0058	0.3446	0.3446
148.00	0.1187	0.1629	0.2706	0.0441	0.2264	0.2264
150.00	-0.0081	0.1231	0.3291	0.1313	0.1979	0.1979
152.00	-0.0706	0.0899	0.2514	0.1604	0.0910	0.0910

ORIGINAL PAGE IS  
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MACH= 1.460  
 ROLL= 90.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSDNC	CYM MSDNC	CYM MSDNC	CYM MSDNC	DEL CYM MSM	CYM MSM
136.00	0.2556	0.2458	0.2475	-0.0097	0.2572	0.2572
138.00	0.2053	0.2299	0.2038	0.0246	0.1792	0.1792
140.00	0.1842	0.1740	0.1646	-0.0102	0.1742	0.1742
142.00	0.2150	0.1658	0.1686	-0.0492	0.2177	0.2177
144.00	0.2448	0.1878	0.1769	-0.0571	0.2340	0.2340
146.00	0.2309	0.2037	0.2129	-0.0272	0.2401	0.2401
148.00	0.0198	0.2557	0.2744	0.2359	0.0385	0.0385
150.00	-0.2317	0.3307	0.3149	0.5624	-0.2475	-0.2475
152.00	-0.2034	0.3198	0.3299	0.5232	-0.1933	-0.1933

TABLE D- 43

MACH= 0.600  
ROLL= 0.00  
ALPP= 145.0

CR MARSHALL STING 'C' RANGE

ALPHA	CR MSDNC	CR MSDNC	CR MSDNC	DEL CR MSM	CR MSM
135.00	0.0109	-0.0056	-0.1749	-0.0765	-0.0984
136.00	0.0244	-0.0628	-0.1555	-0.0872	-0.0683
139.00	0.0340	-0.0623	-0.1526	-0.0963	-0.0593
140.00	0.0418	-0.0458	-0.1329	-0.0876	-0.0453
142.00	0.0283	-0.0453	-0.1200	-0.0746	-0.0454
144.00	0.0328	-0.0335	-0.0977	-0.0663	-0.0313
146.00	0.0427	-0.0161	-0.0675	-0.0587	-0.0087
148.00	0.0421	-0.0185	-0.0522	-0.0605	0.0084
150.00	0.0597	-0.0192	-0.0324	-0.0788	0.0464
152.00					

YACH= 0.800  
ROLL= 0.00  
ALPP= 145.0

CR MARSHALL STING 'C' RANGE

ALPHA	CR MOONSC	CR MSD:ISC	CR MS500C	DEL CR MSM	CR MSM
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136.00	-0.0257	0.0297	-0.0918	0.0590	-0.1508
138.00	-0.0258	0.0359	-0.0932	0.0627	-0.1559
140.00	-0.0201	0.0068	-0.0830	0.0269	-0.1099
142.00	-0.0138	-0.0516	-0.0786	-0.0377	-0.0409
144.00	-0.0078	-0.0517	-0.0793	-0.0539	-0.0254
146.00	-0.0060	-0.0556	-0.0639	-0.0496	-0.0193
148.00	-0.0052	-0.0567	-0.0554	-0.0515	-0.0039
150.00	0.0012	-0.0547	-0.0461	-0.0559	0.0098
152.00	0.0060	-0.0457	-0.0405	-0.0517	0.0112

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TABLE D- 44

MACH= 0.900  
ROLL= 0.00  
ALPP= 145.0

CR MARSHALL STING 'C' RANGE

ALPHA	CR MOONSC	CR MSDNOC	CR MSSOOC	DEL CR MSM	CR MSM
136.00	-0.0505	-0.0791	-0.1508	-0.0287	-0.1222
138.00	-0.0442	-0.0326	-0.1441	0.0116	-0.1557
140.00	-0.0380	0.0272	-0.1374	0.0652	-0.2026
142.00	-0.0304	0.0293	-0.1331	0.0597	-0.1928
144.00	-0.0281	-0.0167	-0.1287	0.0114	-0.1401
146.00	-0.0197	-0.0408	-0.1184	-0.0217	-0.0968
148.00	-0.0100	-0.0451	-0.1072	-0.0362	-0.0710
150.00	-0.0053	-0.0346	-0.0979	-0.0292	-0.0687
152.00	-0.0018	-0.0331	-0.0863	-0.0312	-0.0550

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MACH= 1.050  
ROLL= 0.00  
ALPP= 145.0

CR MARSHALL STING 'C' RANGE

ALPHA	CR MOONSC	CR MSDNOC	CR MSSOOC	DEL CR MSM	CR MSM
136.00	-0.0946	-0.1118	-0.1276	-0.0172	-0.1184
138.00	-0.0891	-0.1071	-0.1271	-0.0180	-0.1091
140.00	-0.0794	-0.1031	-0.1259	-0.0237	-0.1022
142.00	-0.0739	-0.0970	-0.1263	-0.0231	-0.1032
144.00	-0.0672	-0.0955	-0.1223	-0.0283	-0.0941
146.00	-0.0594	-0.0858	-0.0970	-0.0264	-0.0706
148.00	-0.0516	-0.0651	-0.0690	-0.0135	-0.0555
150.00	-0.0413	-0.0509	-0.0537	-0.0096	-0.0441
152.00	-0.0318	-0.0445	-0.0459	-0.0127	-0.0332

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MACH= 1.100  
ROLL= 0.00  
ALPP= 145.0

CR MARSHALL STING 'C' RANGE

ALPHA	CR MOONSC	CR MSD ISC	CR MSOOC	DEL CR MSM	CR MSM
136.00	-0.1132	-0.1175	-0.1192	-0.0043	-0.1149
138.00	-0.1047	-0.1133	-0.1127	-0.0005	-0.1042
140.00	-0.0944	-0.1040	-0.1077	-0.0103	-0.0974
142.00	-0.0853	-0.0973	-0.1006	-0.0120	-0.0965
144.00	-0.0705	-0.0860	-0.1079	-0.0155	-0.0924
146.00	-0.0604	-0.0770	-0.1001	-0.0167	-0.0834
148.00	-0.0584	-0.0708	-0.0865	-0.0123	-0.0742
150.00	-0.0549	-0.0678	-0.0740	-0.0129	-0.0611
152.00	-0.0460	-0.0584	-0.0551	-0.0225	-0.0326

MACH= 1.200  
ROLL= 0.00  
ALPP= 145.0

CR MARSHALL STING 'C' RANGE

ALPHA	CR MOONSC	CR MSD ISC	CR MSOOC	DEL CR MSM	CR MSM
136.00	-0.1171	-0.1083	-0.1178	0.0088	-0.1266
138.00	-0.1046	-0.1050	-0.1107	-0.0004	-0.1103
140.00	-0.0981	-0.1011	-0.1055	-0.0030	-0.1025
142.00	-0.0913	-0.0929	-0.1011	-0.0016	-0.0995
144.00	-0.0854	-0.0798	-0.0973	0.0057	-0.1030
146.00	-0.0728	-0.0673	-0.0917	0.0055	-0.0972
148.00	-0.0647	-0.0584	-0.0840	0.0064	-0.0904
150.00	-0.0634	-0.0544	-0.0742	0.0090	-0.0832
152.00	-0.0564	-0.0536	-0.0693	0.0020	-0.0722

TABLE D- 46

MACH= 1.460  
 ROLL= 0.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSDASC	CR MSDASC	CR MS500C	DEL CR MSM	CR MSM
136.00	-0.1158	-0.1475	-0.1358	-0.0316	-0.1042
138.00	-0.1096	-0.1404	-0.1273	-0.0308	-0.0965
140.00	-0.1014	-0.1303	-0.1200	-0.0289	-0.0911
142.00	-0.0966	-0.1251	-0.1151	-0.0284	-0.0866
144.00	-0.0921	-0.1169	-0.1044	-0.0248	-0.0796
146.00	-0.0823	-0.1050	-0.0934	-0.0227	-0.0707
148.00	-0.0697	-0.0913	-0.0838	-0.0216	-0.0621
150.00	-0.0622	-0.0792	-0.0758	-0.0170	-0.0588
152.00	-0.0571	-0.0708	-0.0621	-0.0137	-0.0584

MACH= 0.600  
 ROLL= 45.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSDASC	CR MSDASC	CR MS500C	DEL CR MSM	CR MSM
136.00	-0.1375	-0.1408	-0.1640	-0.0033	-0.1607
138.00	-0.1284	-0.1346	-0.1570	-0.0052	-0.1508
140.00	-0.1136	-0.1307	-0.1416	-0.0170	-0.1246
142.00	-0.1151	-0.1102	-0.1251	0.0050	-0.1301
144.00	-0.1118	-0.1091	-0.1077	0.0027	-0.1104
146.00	-0.1028	-0.0993	-0.0998	0.0036	-0.1034
148.00	-0.0960	-0.0953	-0.1011	0.0007	-0.1018
150.00	-0.0840	-0.0865	-0.0949	-0.0025	-0.0924
152.00	-0.0726	-0.0807	-0.0817	-0.0001	-0.0736

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TABLE D- 47

MACH= 0.800  
 ROLL= 45.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MOONSC	CR MSDNOC	CR MSSOOC	DEL CR MSM	CR MSM
136.00	-0.1627	-0.1503	-0.1500	0.0125	-0.1625
138.00	-0.1527	-0.1444	-0.1408	0.0083	-0.1571
140.00	-0.1380	-0.1386	-0.1432	-0.0006	-0.1426
142.00	-0.1238	-0.1310	-0.1373	-0.0080	-0.1292
144.00	-0.1123	-0.1289	-0.1300	-0.0166	-0.1134
146.00	-0.1067	-0.1194	-0.1230	-0.0127	-0.1103
148.00	-0.0968	-0.1064	-0.1104	-0.0096	-0.1008
150.00	-0.0897	-0.0997	-0.1001	-0.0100	-0.0901
152.00	-0.0841	-0.0885	-0.0934	-0.0044	-0.0840

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## CR MARSHALL STING 'C' RANGE

MACH= 0.900  
 ROLL= 45.00  
 ALPP= 145.0

ALPHA	CR MOONSC	CR MSDNOC	CR MSSOOC	DEL CR MSM	CR MSM
136.00	-0.1663	-0.1634	-0.1742	0.0229	-0.1972
138.00	-0.1763	-0.1501	-0.1673	0.0262	-0.1936
140.00	-0.1667	-0.1392	-0.1568	0.0275	-0.1843
142.00	-0.1590	-0.1337	-0.1446	0.0253	-0.1699
144.00	-0.1474	-0.1239	-0.1375	0.0235	-0.1610
146.00	-0.1367	-0.1228	-0.1305	0.0139	-0.1444
148.00	-0.1276	-0.1135	-0.1175	0.0141	-0.1316
150.00	-0.1180	-0.1109	-0.1072	0.0071	-0.1143
152.00	-0.1053	-0.0983	-0.0961	0.0070	-0.1030

TABLE D- 48

MACH= 1.050  
 ROLL= 45.00  
 ALPP= 145.0

## CR, MARSHALL STING 'C' RANGE

ALPHA	CR MSDNC	CR MSDNC	CR MSDNC	CR MSDNC	DEL CR MSM	CR MSM
136.00	-0.1791	-0.1608	-0.1746	0.0183	-0.1929	
138.00	-0.1714	-0.1544	-0.1670	0.0170	-0.1840	
140.00	-0.1627	-0.1462	-0.1552	0.0165	-0.1717	
142.00	-0.1419	-0.1357	-0.1401	0.0062	-0.1463	
144.00	-0.1224	-0.1276	-0.1321	-0.0052	-0.1269	
146.00	-0.1125	-0.1231	-0.1235	-0.0105	-0.1130	
148.00	-0.1056	-0.1183	-0.1255	-0.0127	-0.1128	
150.00	-0.0993	-0.1107	-0.1187	-0.0114	-0.1073	
152.00	-0.0901	-0.0997	-0.1052	-0.0096	-0.0956	

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.100  
 ROLL= 45.00  
 ALPP= 145.0

## CR, MARSHALL STING 'C' RANGE

ALPHA	CR MSDNC	CR MSDNC	CR MSDNC	CR MSDNC	DEL CR MSM	CR MSM
136.00	-0.1761	-0.1589	-0.1778	0.0172	-0.1950	
138.00	-0.1689	-0.1538	-0.1702	0.0152	-0.1854	
140.00	-0.1589	-0.1490	-0.1644	0.0100	-0.1744	
142.00	-0.1526	-0.1409	-0.1550	0.0117	-0.1667	
144.00	-0.1456	-0.1364	-0.1505	0.0092	-0.1597	
146.00	-0.1361	-0.1334	-0.1481	0.0027	-0.1508	
148.00	-0.1255	-0.1295	-0.1381	-0.0040	-0.1341	
150.00	-0.1133	-0.1245	-0.1320	-0.0112	-0.1209	
152.00	-0.1002	-0.1127	-0.1182	-0.0124	-0.1057	

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## CR MARSHALL STING 'C' RANGE

MACH= 1.200  
ROLL= 45.00  
ALPP= 145.0

ALPHA	CR MOONSC	CR MSDNOC	CR MS500C	DEL CR MSM	CR MSM
136.00	-0.1617	-0.1666	-0.1507	-0.0049	-0.1458
138.00	-0.1503	-0.1602	-0.1437	-0.0098	-0.1339
140.00	-0.1399	-0.1519	-0.1372	-0.0120	-0.1252
142.00	-0.1313	-0.1422	-0.1283	-0.0109	-0.1174
144.00	-0.1249	-0.1391	-0.1242	-0.0143	-0.1099
146.00	-0.1220	-0.1382	-0.1230	-0.0162	-0.1068
148.00	-0.1169	-0.1345	-0.1149	-0.0176	-0.0973
150.00	-0.1046	-0.1310	-0.1087	-0.0164	-0.0823
152.00	-0.0926	-0.1274	-0.0908	-0.0348	-0.0633

## CR MARSHALL STING 'C' RANGE

MACH= 1.450  
ROLL= 45.00  
ALPP= 145.0

ALPHA	CR MOONSC	CR MSDNOC	CR MS500C	DEL CR MSM	CR MSM
136.00	-0.1532	-0.1529	-0.1406	0.0002	-0.1408
138.00	-0.1433	-0.1495	-0.1314	-0.0062	-0.1252
140.00	-0.1329	-0.1413	-0.1221	-0.0084	-0.1137
142.00	-0.1264	-0.1347	-0.1124	-0.0083	-0.1041
144.00	-0.1201	-0.1265	-0.1032	-0.0065	-0.0967
146.00	-0.1140	-0.1167	-0.0951	-0.0027	-0.0924
148.00	-0.1102	-0.1084	-0.0864	0.0018	-0.0832
150.00	-0.1049	-0.1018	-0.0804	0.0031	-0.0835
152.00	-0.0961	-0.0956	-0.0756	0.0005	-0.0761



TABLE D- 50

MACH= 0.600  
 ROLL= 90.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSDNC	CR MSDNC	CR MSSOOC	DEL CR MSM	CR MSM
136.00	-0.0133	-0.0400	-0.0214	-0.0276	0.0061
138.00	-0.0142	-0.0216	-0.0197	-0.0074	-0.0124
140.00	-0.0008	-0.0201	-0.0135	-0.0193	0.0058
142.00	-0.0036	-0.0138	-0.0134	-0.0101	-0.0033
144.00	-0.0142	-0.0145	-0.0094	-0.0003	-0.0090
146.00	-0.0141	-0.0122	-0.0069	0.0019	-0.0088
148.00	-0.0121	-0.0157	-0.0038	-0.0036	-0.0002
150.00	-0.0046	-0.0197	-0.0034	-0.0151	0.0117
152.00	-0.0025	-0.0210	-0.0041	-0.0185	0.0144

MACH= 0.800  
 ROLL= 90.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSDNC	CR MSDNC	CR MSSOOC	DEL CR MSM	CR MSM
136.00	-0.0143	-0.0383	-0.0310	-0.0240	-0.0070
138.00	-0.0110	-0.0273	-0.0181	-0.0163	-0.0018
140.00	-0.0087	-0.0259	-0.0154	-0.0172	0.0018
142.00	-0.0101	-0.0247	-0.0077	-0.0145	0.0068
144.00	-0.0081	-0.0217	-0.0073	-0.0136	0.0063
146.00	-0.0061	-0.0180	-0.0068	-0.0119	0.0051
148.00	-0.0023	-0.0183	-0.0084	-0.0160	0.0076
150.00	-0.0010	-0.0106	-0.0013	-0.0096	0.0083
152.00	-0.0054	-0.0099	0.0032	-0.0045	0.0077

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TABLE D- 51

MACH= 0.900  
 ROLL= 90.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSDNC	CR MSDNC	CR MSDNC	CR MSDNC	DEL CR MSM	CR MSM
136.00	-0.0158	-0.0440	-0.0461	-0.0273	-0.0273	-0.0189
138.00	-0.0128	-0.0355	-0.0303	-0.0237	-0.0237	-0.0066
140.00	-0.0157	-0.0283	-0.0221	-0.0126	-0.0126	-0.0095
142.00	-0.0219	-0.0267	-0.0132	-0.0048	-0.0048	-0.0084
144.00	-0.0200	-0.0241	-0.0164	-0.0041	-0.0041	-0.0123
146.00	-0.0167	-0.0223	-0.0170	-0.0056	-0.0056	-0.0114
148.00	-0.0179	-0.0239	-0.0150	-0.0060	-0.0060	-0.0090
150.00	-0.0151	-0.0218	-0.0077	-0.0067	-0.0067	-0.0010
152.00	-0.0076	-0.0110	-0.0049	-0.0035	-0.0035	-0.0014

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.050  
 ROLL= 90.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSDNC	CR MSDNC	CR MSDNC	CR MSDNC	DEL CR MSM	CR MSM
136.00	-0.0144	-0.0347	-0.0292	-0.0203	-0.0203	-0.0089
138.00	-0.0152	-0.0366	-0.0327	-0.0215	-0.0215	-0.0112
140.00	-0.0145	-0.0390	-0.0344	-0.0246	-0.0246	-0.0099
142.00	-0.0144	-0.0393	-0.0309	-0.0249	-0.0249	-0.0061
144.00	-0.0148	-0.0380	-0.0227	-0.0232	-0.0232	0.0005
146.00	-0.0143	-0.0346	-0.0112	-0.0203	-0.0203	0.0091
148.00	-0.0137	-0.0282	-0.0041	-0.0145	-0.0145	0.0104
150.00	-0.0126	-0.0223	0.0008	-0.0096	-0.0096	0.0104
152.00	-0.0058	-0.0202	-0.0065	-0.0145	-0.0145	0.0080

TABLE D- 52

MACH= 1.100  
ROLL= 90.00  
ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MOONSC	CR MSDNCS	CR MSSOOC	DEL CR MSM	CR MSM
136.00	-0.0231	-0.0280	-0.0130	-0.0049	-0.0081
138.00	-0.0211	-0.0345	-0.0151	-0.0134	-0.0016
140.00	-0.0156	-0.0356	-0.0188	-0.0200	0.0012
142.00	-0.0127	-0.0370	-0.0200	-0.0243	0.0043
144.00	-0.0136	-0.0364	-0.0209	-0.0228	0.0019
146.00	-0.0146	-0.0351	-0.0191	-0.0205	0.0014
148.00	-0.0142	-0.0340	-0.0139	-0.0198	0.0059
150.00	-0.0130	-0.0313	-0.0096	-0.0182	0.0087
152.00	-0.0110	-0.0287	-0.0071	-0.0177	0.0106

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 1.200  
ROLL= 90.00  
ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MOONSC	CR MSDNCS	CR MSSOOC	DEL CR MSM	CR MSM
136.00	-0.0198	-0.0377	-0.0294	-0.0180	-0.0115
138.00	-0.0181	-0.0412	-0.0272	-0.0231	-0.0041
140.00	-0.0193	-0.0447	-0.0264	-0.0255	-0.0009
142.00	-0.0148	-0.0478	-0.0224	-0.0330	0.0196
144.00	-0.0115	-0.0479	-0.0245	-0.0364	0.0119
146.00	-0.0094	-0.0480	-0.0264	-0.0386	0.0122
148.00	-0.0092	-0.0496	-0.0312	-0.0404	0.0091
150.00	-0.0117	-0.0495	-0.0293	-0.0378	0.0065
152.00	-0.0120	-0.0483	-0.0217	-0.0355	0.0138

TABLE D- 53

MACH= 1.460  
 ROLL= 90.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSDNC	CR MSDNC	CR MSUOC	DEL CR MSM	CR MSM
136.00	-0.0223	-0.0485	-0.0454	-0.0262	-0.0192
138.00	-0.0246	-0.0510	-0.0482	-0.0264	-0.0138
140.00	-0.0237	-0.0518	-0.0379	-0.0281	-0.0098
142.00	-0.0233	-0.0529	-0.0346	-0.0296	-0.0050
144.00	-0.0214	-0.0561	-0.0339	-0.0347	0.0008
146.00	-0.0190	-0.0581	-0.0355	-0.0391	0.0037
148.00	-0.0192	-0.0571	-0.0393	-0.0380	-0.0013
150.00	-0.0207	-0.0546	-0.0418	-0.0339	-0.0080
152.00	-0.0223	-0.0502	-0.0392	-0.0279	-0.0113

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.600  
 ROLL= 0.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSDNC	CAT MSDNC	CAT MSUOC	DEL CAT MSM	CAT MSM
136.00	-2.3414	-2.3656	-2.3760	-0.0242	-2.3517
138.00	-2.3844	-2.4344	-2.4274	-0.0501	-2.3774
140.00	-2.4410	-2.5097	-2.4458	-0.0688	-2.3771
142.00	-2.4396	-2.5603	-2.4580	-0.0608	-2.3972
144.00	-2.5424	-2.6264	-2.5659	-0.0840	-2.4819
146.00	-2.6015	-2.6757	-2.6541	-0.0742	-2.5799
148.00	-2.6248	-2.7077	-2.6914	-0.0829	-2.6085
150.00	-2.6373	-2.7161	-2.7074	-0.0789	-2.6285
152.00	-2.6342	-2.7179	-2.7104	-0.0837	-2.6267

TABLE D- 54

MACH= 0.800  
 ROLL= 0.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDHSC	CAT MSSOOC	DEL CAT MSM	CAT MSM
136.00	-2.5126	-2.5352	-2.5614	-0.0226	-2.5388
138.00	-2.5894	-2.5953	-2.6284	-0.0059	-2.6225
140.00	-2.6632	-2.6658	-2.6923	-0.0026	-2.6897
142.00	-2.7277	-2.7451	-2.7542	-0.0174	-2.7368
144.00	-2.7941	-2.8203	-2.8312	-0.0262	-2.8050
146.00	-2.8569	-2.8922	-2.8898	-0.0353	-2.8545
148.00	-2.8758	-2.9197	-2.9109	-0.0439	-2.8670
150.00	-2.8804	-2.9339	-2.9223	-0.0535	-2.8688
152.00	-2.8832	-2.9442	-2.9239	-0.0610	-2.8629

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.900  
 ROLL= 0.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDHSC	CAT MSSOOC	DEL CAT MSM	CAT MSM
136.00	-2.6617	-2.7246	-2.7440	-0.0630	-2.6811
138.00	-2.7457	-2.7904	-2.8192	-0.0447	-2.7745
140.00	-2.8171	-2.8521	-2.8849	-0.0350	-2.8499
142.00	-2.8871	-2.9191	-2.9577	-0.0320	-2.9257
144.00	-2.9662	-2.9863	-3.0245	-0.0201	-3.0043
146.00	-3.0359	-3.0603	-3.0926	-0.0204	-3.0722
148.00	-3.0797	-3.1030	-3.1322	-0.0232	-3.1090
150.00	-3.0997	-3.1300	-3.1485	-0.0303	-3.1182
152.00	-3.1150	-3.1463	-3.1566	-0.0313	-3.1254

TABLE D- 55

MACH= 1.050  
ROLL= 0.00  
ALPP= 145.0

CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDNOC	CAT MSUOC	DEL CAT MSM	CAT MSM
136.00	-2.8999	-2.9128	-2.9043	-0.0128	-2.8914
138.00	-2.9933	-2.9921	-2.9935	0.0012	-2.9947
140.00	-3.0859	-3.0713	-3.0798	0.0145	-3.0344
142.00	-3.1775	-3.1604	-3.1747	0.0170	-3.1917
144.00	-3.2878	-3.2617	-3.2922	0.0261	-3.3183
146.00	-3.3851	-3.3485	-3.3837	0.0366	-3.4204
148.00	-3.4484	-3.4026	-3.4490	0.0458	-3.4943
150.00	-3.5021	-3.4773	-3.4852	0.0647	-3.5499
152.00	-3.5507	-3.4417	-3.5357	0.0790	-3.6147

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 1.100  
ROLL= 0.00  
ALPP= 145.0

CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDNOC	CAT MSUOC	DEL CAT MSM	CAT MSM
136.00	-2.9954	-3.0137	-2.9781	-0.0183	-2.9598
138.00	-3.1031	-3.1069	-3.0718	-0.0038	-3.0680
140.00	-3.2093	-3.1942	-3.1594	0.0150	-3.1745
142.00	-3.3121	-3.2813	-3.2514	0.0308	-3.2822
144.00	-3.3973	-3.3643	-3.3490	0.0330	-3.3820
146.00	-3.4742	-3.4395	-3.4330	0.0347	-3.4677
148.00	-3.5306	-3.4902	-3.4927	0.0404	-3.5331
150.00	-3.5537	-3.5204	-3.5277	0.0333	-3.5611
152.00	-3.5700	-3.5552	-3.5442	0.0147	-3.5590

TABLE D- 56

MACH= 1.200  
ROLL= 0.00  
ALPP= 145.0

CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDNC	CAT MSDOOC	DEL CAT MSM	CAT MSM
136.00	-3.0991	-3.0767	-3.0388	0.0224	-3.0613
138.00	-3.2108	-3.1778	-3.1389	0.0331	-3.1720
140.00	-3.3160	-3.2760	-3.2396	0.0401	-3.2796
142.00	-3.4161	-3.3619	-3.3446	0.0542	-3.3988
144.00	-3.5095	-3.4500	-3.4489	0.0595	-3.5084
146.00	-3.5863	-3.5336	-3.5379	0.0527	-3.5906
148.00	-3.6456	-3.6037	-3.6232	0.0420	-3.6652
150.00	-3.6883	-3.6534	-3.6652	0.0350	-3.7001
152.00	-3.7038	-3.6720	-3.6793	0.0319	-3.7111

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 1.460  
ROLL= 0.00  
ALPP= 145.0

CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDNC	CAT MSDOOC	DEL CAT MSM	CAT MSM
136.00	-3.0897	-3.0830	-3.0499	0.0067	-3.0566
138.00	-3.2085	-3.1891	-3.1489	0.0194	-3.1683
140.00	-3.2995	-3.2740	-3.2412	0.0255	-3.2667
142.00	-3.3734	-3.3455	-3.3169	0.0280	-3.3449
144.00	-3.4363	-3.4068	-3.3949	0.0295	-3.4245
146.00	-3.4989	-3.4690	-3.4704	0.0299	-3.5003
148.00	-3.5659	-3.5352	-3.5412	0.0307	-3.5719
150.00	-3.6384	-3.5963	-3.6221	0.0421	-3.6642
152.00	-3.6962	-3.6476	-3.6471	0.0486	-3.6957

TABLE D- 57

MACH= 0.600  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSDNC	CAT MSDNC	CAT MSUOC	DEL CAT MSM	CAT MSM
136.00	-2.3221	-2.3402	-2.3260	-0.0180	-2.3080
138.00	-2.3938	-2.4195	-2.3987	-0.0247	-2.3740
140.00	-2.4635	-2.4955	-2.4777	-0.0320	-2.4457
142.00	-2.5474	-2.5782	-2.5640	-0.0309	-2.5338
144.00	-2.6073	-2.6509	-2.6305	-0.0436	-2.5869
146.00	-2.6621	-2.7082	-2.6754	-0.0461	-2.6293
148.00	-2.6949	-2.7442	-2.7068	-0.0493	-2.6575
150.00	-2.7198	-2.7649	-2.7232	-0.0451	-2.6781
152.00	-2.7050	-2.7592	-2.7361	-0.0542	-2.6818

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.800  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSDNC	CAT MSDNC	CAT MSUOC	DEL CAT MSM	CAT MSM
136.00	-2.4576	-2.4662	-2.4267	-0.0086	-2.4181
138.00	-2.5207	-2.5249	-2.5601	-0.0041	-2.5560
140.00	-2.5836	-2.6065	-2.6456	-0.0229	-2.6227
142.00	-2.6583	-2.6999	-2.7577	-0.0416	-2.7161
144.00	-2.7431	-2.7942	-2.8467	-0.0510	-2.7956
146.00	-2.8227	-2.8660	-2.9107	-0.0433	-2.8674
148.00	-2.8725	-2.9283	-2.9521	-0.0557	-2.8964
150.00	-2.9027	-2.9568	-2.9643	-0.0541	-2.9102
152.00	-2.9079	-2.9710	-2.9640	-0.0631	-2.9009



TABLE D- 58

MACH= 0.900  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	LIT MSDNFC	CAT MSSOOC	DEL CAT MSM	CAT MSM
136.00	-2.6159	-2.6457	-2.6513	-0.0298	-2.6216
138.00	-2.7164	-2.7074	-2.7127	0.0090	-2.7217
140.00	-2.8013	-2.7743	-2.8119	0.0270	-2.8389
142.00	-2.6705	-2.8769	-2.8925	-0.0064	-2.8861
144.00	-2.9540	-2.9577	-2.9704	-0.0029	-2.9675
146.00	-3.0290	-3.0429	-3.0540	-0.0139	-3.0402
148.00	-3.0929	-3.1209	-3.1139	-0.0281	-3.0859
150.00	-3.1338	-3.1557	-3.1464	-0.0219	-3.1245
152.00	-3.1377	-3.1653	-3.1639	-0.0275	-3.1363

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.050  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDNFC	CAT MSSOOC	DEL CAT MSM	CAT MSM
136.00	-2.8879	-2.9133	-2.8991	-0.0254	-2.8737
138.00	-2.9983	-2.9979	-3.0050	0.0004	-3.0054
140.00	-3.1021	-3.0867	-3.1203	0.0153	-3.1357
142.00	-3.1876	-3.1796	-3.2251	0.0080	-3.2330
144.00	-3.2891	-3.2649	-3.3167	0.0241	-3.3408
146.00	-3.3832	-3.3347	-3.3765	0.0485	-3.4250
148.00	-3.4347	-3.3828	-3.4179	0.0518	-3.4697
150.00	-3.4886	-3.4189	-3.5032	0.0698	-3.5729
152.00	-3.5391	-3.4800	-3.5629	0.0591	-3.6220

TABLE D- 59

MACH= 1.100  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDNOC	CAT MSSOOC	DEL CAT MSM	CAT MSM
136.00	-3.0200	-3.0293	-3.0130	-0.0093	-3.0037
138.00	-3.1283	-3.1230	-3.1032	0.0053	-3.1084
140.00	-3.2392	-3.2090	-3.2010	0.0302	-3.2320
142.00	-3.3438	-3.3053	-3.3101	0.0384	-3.3485
144.00	-3.4373	-3.3916	-3.3974	0.0457	-3.4430
146.00	-3.4792	-3.4517	-3.4480	0.0275	-3.4756
148.00	-3.4770	-3.4846	-3.4891	-0.0076	-3.4815
150.00	-3.4920	-3.5059	-3.5229	-0.0130	-3.5091
152.00	-3.5371	-3.5430	-3.5436	-0.0059	-3.5377

ORIGINAL PAGE IS  
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MACH= 1.200  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDNOC	CAT MSSOOC	DEL CAT MSM	CAT MSM
136.00	-3.1483	-3.1171	-3.0992	0.0313	-3.1305
138.00	-3.2515	-3.2154	-3.1984	0.0361	-3.2345
140.00	-3.3526	-3.3160	-3.3019	0.0366	-3.3385
142.00	-3.4573	-3.4149	-3.3980	0.0424	-3.4404
144.00	-3.5485	-3.4992	-3.4843	0.0493	-3.5336
146.00	-3.6092	-3.5609	-3.5543	0.0483	-3.6026
148.00	-3.6502	-3.6073	-3.6207	0.0429	-3.6636
150.00	-3.6789	-3.6421	-3.6707	0.0367	-3.7074
152.00	-3.6905	-3.6644	-3.7014	0.0262	-3.7275

ORIGINAL PAGE IS  
OF POOR QUALITY

TABLE D- 60

MACH= 1.460  
ROLL= 45.00  
ALPP= 145.0

CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDNOC	CAT MSNOC	DEL CAT MSM	CAT MSM
136.00	-3.0943	-3.0950	-3.0483	-0.0002	-3.0481
138.00	-3.2141	-3.2012	-3.1526	0.0129	-3.1655
140.00	-3.3047	-3.2899	-3.2428	0.0148	-3.2576
142.00	-3.3793	-3.3642	-3.3229	0.0152	-3.3380
144.00	-3.4410	-3.4279	-3.3909	0.0130	-3.4040
146.00	-3.5019	-3.4855	-3.4205	0.0164	-3.4769
148.00	-3.5638	-3.5446	-3.5331	0.0192	-3.5522
150.00	-3.6160	-3.6032	-3.6033	0.0128	-3.6162
152.00	-3.6586	-3.6520	-3.6679	0.0058	-3.6737

MACH= 0.600  
ROLL= 90.00  
ALPP= 145.0

CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDNOC	CAT MSNOC	DEL CAT MSM	CAT MSM
136.00	-2.3394	-2.3755	-2.3417	-0.0361	-2.3056
138.00	-2.3860	-2.4354	-2.3997	-0.0494	-2.3503
140.00	-2.4368	-2.4947	-2.4526	-0.0579	-2.3947
142.00	-2.4954	-2.5531	-2.5170	-0.0578	-2.4592
144.00	-2.5532	-2.6081	-2.5781	-0.0549	-2.5232
146.00	-2.6171	-2.6753	-2.6465	-0.0582	-2.5883
148.00	-2.6722	-2.7429	-2.7098	-0.0707	-2.6392
150.00	-2.7114	-2.7788	-2.7513	-0.0674	-2.6839
152.00	-2.7192	-2.7893	-2.7620	-0.0701	-2.6918

TABLE D- 61

MACH= 0.800  
 ROLL= 90.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSDNC	CAT MSDNC	CAT MS00C	DEL CAT MSM	CAT MSM
136.00	-2.1987	-2.5217	-2.5390	-0.0231	-2.5159
138.00	-2.5494	-2.5805	-2.5916	-0.0311	-2.5606
140.00	-2.6032	-2.6377	-2.6413	-0.0345	-2.6068
142.00	-2.6617	-2.7062	-2.6964	-0.0445	-2.6519
144.00	-2.7332	-2.7876	-2.7728	-0.0544	-2.7184
146.00	-2.8141	-2.8660	-2.8585	-0.0519	-2.8066
148.00	-2.8760	-2.9235	-2.9196	-0.0535	-2.8661
150.00	-2.9100	-2.9787	-2.9574	-0.0687	-2.8887
152.00	-2.9420	-2.9921	-2.9641	-0.0501	-2.9340

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 0.900  
 ROLL= 90.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSDNC	CAT MSDNC	CAT MS00C	DEL CAT MSM	CAT MSM
136.00	-2.6402	-2.6757	-2.6969	-0.0355	-2.6615
138.00	-2.7321	-2.7520	-2.7724	-0.0199	-2.7524
140.00	-2.8086	-2.8272	-2.8464	-0.0186	-2.8278
142.00	-2.8879	-2.9117	-2.9055	-0.0238	-2.8817
144.00	-2.9711	-2.9889	-2.9877	-0.0178	-2.9699
146.00	-3.0392	-3.0627	-3.0659	-0.0235	-3.0424
148.00	-3.1003	-3.1205	-3.1144	-0.0201	-3.0943
150.00	-3.1430	-3.1545	-3.1522	-0.0115	-3.1407
152.00	-3.1722	-3.1854	-3.1887	-0.0131	-3.1756

TABLE D- 62

MACH= 1.050  
ROLL= 90.00  
ALPP= 1-15.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDNOC	CAT MSOOC	DEL CAT MSM	CAT MSM
136.00	-2.8882	-2.9374	-2.9189	-0.0492	-2.8697
138.00	-2.9936	-3.0167	-3.0154	-0.0232	-2.9922
140.00	-3.0971	-3.1051	-3.1158	-0.0080	-3.1079
142.00	-3.2032	-3.2093	-3.2200	-0.0061	-3.2139
144.00	-3.3281	-3.3129	-3.3206	0.0152	-3.3358
146.00	-3.4368	-3.3986	-3.4195	0.0383	-3.4578
148.00	-3.4940	-3.4566	-3.5001	0.0374	-3.5375
150.00	-3.5391	-3.4939	-3.5406	0.0452	-3.5858
152.00	-3.5761	-3.5380	-3.5716	0.0380	-3.6096

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 1.100  
ROLL= 90.00  
ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MOONSC	CAT MSDNOC	CAT MSOOC	DEL CAT MSM	CAT MSM
136.00	-3.0264	-3.0456	-3.0018	-0.0192	-2.9827
138.00	-3.1240	-3.1369	-3.1030	-0.0128	-3.0902
140.00	-3.2284	-3.2203	-3.2010	0.0081	-3.2091
142.00	-3.3295	-3.3105	-3.2957	0.0190	-3.3147
144.00	-3.4182	-3.4021	-3.3876	0.0161	-3.4037
146.00	-3.4879	-3.4789	-3.4747	0.0090	-3.4837
148.00	-3.5363	-3.5360	-3.5335	0.0003	-3.5338
150.00	-3.5635	-3.5750	-3.5692	-0.0115	-3.5577
152.00	-3.5805	-3.5958	-3.5798	-0.0153	-3.5645

TABLE D- 63

MACH= 1.200  
 ROLL= 90.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSDNC	CAT MSDNC	CAT MSSOOC	DEL CAT MSM	CAT MSM
136.00	-3.1337	-3.1335	-3.0927	0.0001	-3.0928
138.00	-3.2363	-3.2249	-3.1863	0.0114	-3.1977
140.00	-3.3280	-3.3218	-3.2821	0.0062	-3.2883
142.00	-3.4279	-3.4187	-3.3848	0.0092	-3.3940
144.00	-3.5182	-3.5084	-3.4888	0.0098	-3.4906
146.00	-3.5965	-3.5836	-3.5670	0.0129	-3.5799
148.00	-3.6649	-3.6448	-3.6441	0.0201	-3.6642
150.00	-3.7106	-3.6899	-3.6065	0.0207	-3.7072
152.00	-3.7283	-3.7128	-3.7086	0.0155	-3.7240

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.460  
 ROLL= 90.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSDNC	CAT MSDNC	CAT MSSOOC	DEL CAT MSM	CAT MSM
136.00	-3.0985	-3.1132	-3.0519	-0.0146	-3.0373
138.00	-3.2105	-3.2151	-3.1534	-0.0046	-3.1468
140.00	-3.2953	-3.2991	-3.2445	-0.0038	-3.2407
142.00	-3.3699	-3.3775	-3.3272	-0.0076	-3.3196
144.00	-3.4348	-3.4429	-3.3947	-0.0081	-3.3867
146.00	-3.4975	-3.5021	-3.4706	-0.0046	-3.4659
148.00	-3.5623	-3.5661	-3.5398	-0.0037	-3.5360
150.00	-3.6257	-3.6289	-3.6108	-0.0031	-3.6077
152.00	-3.6812	-3.6813	-3.6689	-0.0002	-3.6687

TABLE D- 64

MACH= 0.600  
ROLL= 0.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MS500C	CN MS5NDC	CN MOONSC	DEL CN MM	CN MM
136.00	6.4566	6.8159	7.6582	0.3593	7.2989
138.00	6.0085	6.3280	6.5388	0.3195	6.2192
140.00	5.5947	5.8855	5.8145	0.2908	5.5237
142.00	5.2311	5.4746	5.3776	0.2435	5.1341
144.00	4.8833	5.0671	5.0009	0.1838	4.8171
146.00	4.4882	4.6501	4.5067	0.1619	4.4348
148.00	4.1262	4.2507	4.2211	0.1245	4.0966
150.00	3.7356	3.8289	3.8478	0.0933	3.7545
152.00	3.3349	3.3970	3.4487	0.0630	3.3857

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 0.800  
ROLL= 0.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MS500C	CN MS5NDC	CN MOONSC	DEL CN MM	CN MM
136.00	7.9568	8.1577	8.7795	0.2008	8.5787
138.00	7.3232	7.4903	8.1339	0.1672	7.9667
140.00	6.7097	6.8650	7.4735	0.1559	7.3176
142.00	6.1524	6.2873	6.7824	0.1348	6.6475
144.00	5.6018	5.7137	6.1345	0.1120	6.0226
146.00	5.0588	5.1592	5.5301	0.1004	5.4296
148.00	4.5855	4.6281	4.9760	0.0426	4.9334
150.00	4.1005	4.1458	4.4430	0.0453	4.3977
152.00	3.6549	3.6964	3.9788	0.0414	3.9374

TABLE D- 65

MACH= 0.900  
ROLL= 0.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MM	CN MM
136.00	8.9839	9.0474	9.5756	0.0635	9.5121
138.00	8.4549	8.4750	8.9330	0.0201	8.9129
140.00	7.8188	7.7697	8.2390	-0.0491	8.2881
142.00	7.0964	7.0462	7.5168	-0.0502	7.5670
144.00	6.3897	6.3917	6.7946	0.0020	6.7926
146.00	5.7339	5.7678	6.1324	0.0329	6.0906
148.00	5.1356	5.1922	5.5134	0.0567	5.4567
150.00	4.5331	4.6026	4.8855	0.0696	4.8159
152.00	3.9861	4.0571	4.3339	0.0710	4.2629

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 1.050  
ROLL= 0.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MM	CN MM
136.00	10.7926	10.9000	11.5865	0.1074	11.4790
138.00	9.9789	10.0293	10.6983	0.0503	10.6480
140.00	9.0865	9.0881	9.7175	0.0016	9.7158
142.00	8.2087	8.2654	8.7476	0.0566	8.6910
144.00	7.4889	7.5373	7.9096	0.0484	7.8612
146.00	6.7355	6.8197	7.1265	0.0842	7.0423
148.00	6.0316	6.0809	6.3622	0.0493	6.3130
150.00	5.3774	5.4372	5.7097	0.0598	5.6499
152.00	4.7094	4.8793	5.1300	0.0899	5.0409



TABLE D- 66

MACH= 1.100  
ROLL= 0.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MM	CN MM
136.00	11.7065	11.8513	12.6007	0.0847	12.5159
138.00	10.9132	11.0103	11.7589	0.0971	11.6618
140.00	10.0003	10.1160	10.7948	0.1157	10.6792
142.00	9.0964	9.2099	9.7817	0.1135	9.6683
144.00	8.1968	8.3300	8.8214	0.1332	8.6882
146.00	7.3930	7.5367	7.9027	0.1437	7.7590
148.00	6.5165	6.6041	7.0332	0.0876	6.9456
150.00	5.8772	5.9129	6.2495	0.0357	6.2138
152.00	5.1852	5.2386	5.5492	0.0534	5.4958

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OF POOR QUALITY

MACH= 1.200  
ROLL= 0.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MM	CN MM
136.00	12.2604	12.2231	12.9171	-0.0373	12.9544
138.00	11.3873	11.3841	12.0383	-0.0032	12.0416
140.00	10.4941	10.5101	11.1449	0.0160	11.1289
142.00	9.5755	9.6262	10.1517	0.0506	10.1010
144.00	8.6768	8.7334	9.2013	0.0566	9.1447
146.00	7.9044	7.9723	8.3328	0.0679	8.2648
148.00	7.0574	7.1312	7.4993	0.0738	7.4255
150.00	6.3160	6.3738	6.7160	0.0578	6.6590
152.00	5.5655	5.6532	5.9841	0.0877	5.8964

TABLE D- 67

MACH= 1.450  
 ROLL= 0.00  
 ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MM	CN MM
136.00	11.5951	11.5038	12.0013	-0.0913	12.0926
138.00	10.8785	10.8097	11.2892	-0.0687	11.3579
140.00	10.1362	10.0837	10.5463	-0.0525	10.5987
142.00	9.3504	9.3243	9.7814	-0.0262	9.8076
144.00	8.5816	8.5693	8.9602	-0.0123	8.9725
146.00	7.8495	7.8447	8.1943	-0.0048	8.1991
148.00	7.1309	7.1326	7.4878	0.0017	7.4861
150.00	6.4567	6.4716	6.8926	0.0149	6.8777
152.00	5.7249	5.7954	6.2929	0.0705	6.2224

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.600  
 ROLL= 45.00  
 ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSHDC	CN MOONSC	DEL CN MM	CN MM
136.00	4.8306	5.1521	5.6586	0.3214	5.3371
138.00	4.4768	4.7566	5.2754	0.2798	4.9955
140.00	4.2691	4.4859	5.0215	0.2167	4.8047
142.00	4.0856	4.2846	4.9000	0.1990	4.7011
144.00	3.7787	3.9683	4.5435	0.1896	4.3539
146.00	3.3999	3.5834	4.1399	0.1835	3.9564
148.00	3.0362	3.1870	3.6512	0.1508	3.5003
150.00	2.6900	2.8209	3.2547	0.1229	3.1318
152.00	2.4025	2.5099	2.9128	0.1074	2.8054

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TJUT 660 SRB STING INTERFERENCE STUDY-INTERPOLATED DATA

TABLE D- 68

CN MARSHALL STING 'C' RANGE

MACH= 0.800  
ROLL= 45.00  
ALPP= 145.0

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MM	CN MM
136.00	6.5303	6.5813	7.3148	0.0430	7.2718
138.00	5.8972	5.9404	6.7378	0.0432	6.6945
140.00	5.3374	5.4000	6.0396	0.0627	5.9770
142.00	5.0023	5.1375	5.5468	0.1352	5.4116
144.00	4.5097	4.6451	5.0100	0.1353	4.8747
146.00	3.9650	4.0699	4.4328	0.1049	4.3279
148.00	3.4899	3.5863	3.8582	0.0964	3.7618
150.00	3.0541	3.1582	3.4176	0.1042	3.3134
152.00	2.6544	2.7739	3.0022	0.1195	2.8827

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OF POOR QUALITY

CN MARSHALL STING 'C' RANGE

MACH= 0.900  
ROLL= 45.00  
ALPP= 145.0

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MM	CN MM
136.00	7.8484	7.7910	8.3591	-0.0574	8.4165
138.00	7.1916	7.1890	7.7568	-0.0026	7.7594
140.00	6.5105	6.5593	7.1652	0.0487	7.1165
142.00	5.9443	5.9764	6.5895	0.0321	6.5574
144.00	5.3661	5.3879	5.9927	0.0218	5.9709
146.00	4.7364	4.7659	5.2963	0.0296	5.2668
148.00	4.0778	4.1276	4.5943	0.0497	4.5445
150.00	3.5062	3.5727	3.9987	0.0665	3.9322
152.00	3.0177	3.1091	3.4647	0.0914	3.3733

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TJ-660 SRB STING INTERFERENCE STUDY-INTERPOLATED DATA NOV 81

TABLE D- 69

MACH= 1.050  
ROLL= 45.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MSG00C	CN MSGNDC	CN MOONSC	DEL CN MM	CN MM
136.00	9.8258	9.7976	10.6569	-0.0282	10.3851
138.00	9.0008	8.9896	9.7623	-0.0112	9.7735
140.00	8.1105	8.1152	8.7450	0.0047	8.7403
142.00	7.3351	7.3459	7.8053	0.0108	7.7946
144.00	6.6409	6.6235	7.0183	-0.0174	7.0357
146.00	5.9806	6.0121	6.3070	0.0314	6.2756
148.00	5.3055	5.2797	5.5991	-0.0258	5.6250
150.00	4.6175	4.6171	4.9499	0.0596	4.8903
152.00	4.1151	4.1637	4.4269	0.0536	4.3733

MACH= 1.100  
ROLL= 45.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MSG00C	CN MSGNDC	CN MOONSC	DEL CN MM	CN MM
136.00	10.6720	10.7035	11.4436	0.0315	11.4122
138.00	9.8526	9.9057	10.6183	0.0532	10.5652
140.00	9.0012	9.0728	9.7555	0.0716	9.6839
142.00	8.1897	8.2559	8.8513	0.0663	8.7850
144.00	7.3429	7.4072	7.9939	0.0643	7.9296
146.00	6.5507	6.5944	7.0957	0.0437	7.0520
148.00	5.7871	5.8621	6.2034	0.0751	6.1283
150.00	5.0885	5.1446	5.4592	0.0561	5.4031
152.00	4.4039	4.4674	4.7600	0.0635	4.6965

TABLE D- 70

MACH= 1.200  
 ROLL= 45.00  
 ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MM	CN MM
136.00	11.2375	11.1674	11.7561	-0.0701	11.8262
138.00	10.3669	10.3479	10.8470	-0.0189	10.8659
140.00	9.5252	9.5170	10.0039	-0.0081	10.0121
142.00	8.7233	8.7359	9.2171	0.0126	9.2045
144.00	7.8793	7.9405	8.4203	0.0612	8.3591
146.00	7.0829	7.1494	7.5661	0.0665	7.4996
148.00	6.3019	6.3581	6.6954	0.0562	6.6393
150.00	5.5886	5.7031	5.9037	0.1145	5.7892
152.00	4.8593	4.9275	5.1914	0.0581	5.1333

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MACH= 1.460  
 ROLL= 45.00  
 ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MM	CN MM
136.00	10.9685	10.7953	11.4117	-0.1732	11.5849
138.00	10.2596	10.1149	10.6795	-0.1447	10.8243
140.00	9.5135	9.3989	9.9376	-0.1146	10.0522
142.00	8.7633	8.6851	9.1970	-0.0781	9.2751
144.00	8.0197	7.9491	8.4357	-0.0705	8.5063
146.00	7.2525	7.2040	7.6513	-0.0485	7.6998
148.00	6.5117	6.4848	6.8840	-0.0269	6.9109
150.00	5.8184	5.7732	6.1545	-0.0452	6.1997
152.00	5.1307	5.1060	5.4465	-0.0247	5.4712

TABLE D- 71

MACH= 0.600  
ROLL= 90.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MMI	CN MMI
136.00	4.4076	4.6853	4.9632	0.2777	4.6855
138.00	4.2530	4.4952	4.8363	0.2422	4.5941
140.00	4.0788	4.3045	4.6428	0.2257	4.4171
142.00	3.8584	4.0744	4.3813	0.2160	4.1652
144.00	3.6137	3.8187	4.0974	0.2050	3.8924
146.00	3.3464	3.5448	3.8249	0.1984	3.6265
148.00	3.0199	3.2033	3.4245	0.1835	3.2410
150.00	2.7024	2.8683	3.0964	0.1659	2.9305
152.00	2.4072	2.5607	2.7751	0.1535	2.621

MACH= 0.800  
ROLL= 90.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MMI	CN MMI
136.00	6.2672	6.2557	6.9694	-0.0115	5.9809
138.00	5.6979	5.6523	6.2494	-0.0455	6.2949
140.00	5.1143	5.1102	5.5999	-0.0041	5.6041
142.00	4.6587	4.6634	5.0971	0.0047	5.0925
144.00	4.2856	4.3036	4.7145	0.0180	4.6965
146.00	3.9306	3.9468	4.4383	0.0162	4.4221
148.00	3.5376	3.5541	3.8909	0.0165	3.8744
150.00	3.1535	3.1780	3.4833	0.0244	3.4588
152.00	2.8189	2.8329	3.1230	0.0140	3.1090

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TABLE D- 72

MACH= 0.900  
ROLL= 90.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MM	CN MM
136.00	7.9541	7.8501	8.4760	-0.1040	8.5800
138.00	7.3358	7.1655	7.7989	-0.1702	7.9691
140.00	6.5977	6.4360	7.0224	-0.1617	7.1841
142.00	5.8901	5.7564	6.3304	-0.1338	6.4641
144.00	5.2294	5.0737	5.6553	-0.1557	5.8110
146.00	4.6966	4.5982	5.0532	-0.0984	5.1516
148.00	4.0962	4.0427	4.3676	-0.0535	4.4211
150.00	3.5898	3.5586	3.8767	-0.0311	3.9078
152.00	3.1779	3.1630	3.4241	-0.0149	3.4389

MACH= 1.050  
ROLL= 90.00  
ALPP= 145.0

CN MARSHALL STING 'C' RANGE

ALPHA	CN MSS00C	CN MSSNDC	CN MOONSC	DEL CN MM	CN MM
136.00	10.2447	10.1116	10.8303	-0.1331	10.9634
138.00	9.3752	9.1934	9.8321	-0.1817	10.0138
140.00	8.4491	8.2768	8.8923	-0.1724	9.0647
142.00	7.5776	7.4182	7.9371	-0.1594	8.0965
144.00	6.7124	6.6306	7.0607	-0.0818	7.1425
146.00	6.0136	5.9775	6.2952	-0.0361	6.3313
148.00	5.3512	5.2401	5.5788	-0.1111	5.6900
150.00	4.7070	4.6516	4.9392	-0.0554	4.9946
152.00	4.1529	4.0711	4.3555	-0.0810	4.4373

TABLE D- 73

MACH= 1.100  
ROLL= 90.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MS500C	CN MS5HDC	CN MOONSC	DEL CN MM	CN MM
136.00	11.0911	11.0740	11.7658	-0.0172	11.7829
138.00	10.2135	10.1906	10.8513	-0.0229	10.8742
140.00	9.3253	9.2895	9.9355	-0.0358	9.9712
142.00	8.4139	8.3615	8.9639	-0.0524	9.0163
144.00	7.5283	7.4808	8.0065	-0.0475	8.0540
146.00	6.6972	6.6422	7.0944	-0.0549	7.1494
148.00	5.8898	5.8664	6.2314	-0.0234	6.2548
150.00	5.1459	5.1056	5.4330	-0.013	5.4772
152.00	4.4618	4.4204	4.7176	-0.0413	4.7589

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MACH= 1.200  
ROLL= 90.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MS500C	CN MS5HDC	CN MOONSC	DEL CN MM	CN MM
136.00	11.6206	11.5301	12.0550	-0.0905	12.1455
138.00	10.7122	10.6654	11.1213	-0.0468	11.1681
140.00	9.7652	9.7671	10.1374	0.0019	10.1355
142.00	8.8761	8.9116	9.2489	0.0355	9.2134
144.00	8.0368	8.0708	8.3762	0.0400	8.3362
146.00	7.2244	7.2559	7.5234	0.0315	7.4919
148.00	6.4281	6.4424	6.6986	0.0140	6.6846
150.00	5.6425	5.6564	5.8900	0.0139	5.8762
152.00	4.9025	4.8908	5.1378	-0.0116	5.1495



TABLE D- 74

MACH= 1.460  
ROLL= 00.00  
ALPP= 145.0

## CN MARSHALL STING 'C' RANGE

ALPHA	CN MSSOOC	CN MSSNDC	CN MOONSC	DEL CN MMH	CN MMH
136.00	11.2437	11.1087	11.5980	-0.1349	11.7330
138.00	10.5497	10.4423	10.8966	-0.1074	11.0041
140.00	9.7836	9.6949	10.1159	-0.0887	10.2046
142.00	9.0010	8.9225	9.3276	-0.0784	9.4060
144.00	8.2443	8.1952	8.5754	-0.0491	8.6245
146.00	7.4624	7.4335	7.8139	-0.0288	7.8427
148.00	6.6806	6.6535	7.0352	-0.0271	7.0623
150.00	5.9055	5.9045	6.2693	-0.0010	6.2903
152.00	5.2072	5.1838	5.5706	-0.0235	5.5941

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MACH= 0.600  
ROLL= 0.00  
ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MMH	CM MMH
136.00	-2.3346	-1.3998	0.9849	0.9348	0.0501
138.00	-2.2496	-1.3191	-0.1381	0.9305	-1.0686
140.00	-1.9571	-1.0491	-0.6478	0.9680	-1.5558
142.00	-1.6586	-0.7432	-0.5248	0.9154	-1.4402
144.00	-1.4152	-0.5112	-0.2616	0.9039	-1.1655
146.00	-1.1774	-0.3219	-0.0093	0.8555	-0.0648
148.00	-0.9389	-0.1319	0.1372	0.7990	-0.6618
150.00	-0.7455	0.4256	0.2622	0.7721	-0.5099
152.00	-0.6035	0.0590	0.2163	0.7425	-0.5262

TABLE D- 75

MACH= 0.800  
 ROLL= 0.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MS500C	CM MS5NDC	CM MOONSC	DEL CM MM	CM MM
136.00	-3.4052	-2.6073	-1.4662	0.7979	-2.2642
138.00	-3.1821	-2.4197	-1.2392	0.7624	-2.0015
140.00	-2.8030	-2.0728	-1.0171	0.7302	-1.7474
142.00	-2.3018	-1.6429	-0.8844	0.6589	-1.5433
144.00	-1.7610	-1.1898	-0.6726	0.5711	-1.2437
146.00	-1.2252	-0.7612	-0.2536	0.4640	-0.7176
148.00	-0.7306	-0.3485	0.0709	0.3821	-0.3112
150.00	-0.4070	-0.0884	0.3341	0.3187	0.0154
152.00	-0.2954	0.0781	0.3601	0.3746	0.0055

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MACH= 0.900  
 ROLL= 0.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MS500C	CM MS5NDC	CM MOONSC	DEL CM MM	CM MM
136.00	-3.6315	-3.2234	-2.4202	0.4081	-2.8284
138.00	-2.7572	-2.6632	-1.9545	0.0940	-2.0485
140.00	-2.15	-2.2254	-1.6203	-0.0711	-1.5491
142.00	-1.6	-2.1186	-1.3517	-0.2680	-1.0637
144.00	-1.430	-1.6255	-0.9233	-0.1350	-0.7862
146.00	-1.0363	-0.9757	-0.4024	0.0566	-0.4590
148.00	-0.4881	-0.3548	0.1317	0.1333	-0.0016
150.00	-0.0295	0.1177	0.5393	0.1472	0.3921
152.00	0.2033	0.4005	0.7982	0.1972	0.6010

TABLE D- 76

## CM MARSHALL STING 'C' RANGE

MACH= 1.050  
 ROLL= 0.00  
 ALPP= 145.0

ALPHA	CM MSUOC	CM MSNDC	CM MOHSC	DEL CM MM	CM MM
136.00	-3.2802	-3.0925	-2.1676	0.1878	-2.3553
138.00	-3.3938	-3.2733	-2.3319	0.1205	-2.4524
140.00	-3.5359	-3.5370	-2.7035	-0.0011	-2.7024
142.00	-3.5293	-3.5768	-2.9942	-0.0475	-2.9467
144.00	-3.0168	-3.2350	-2.7880	-0.2182	-2.5698
146.00	-2.4530	-2.6787	-2.4419	-0.2257	-2.2162
148.00	-2.3664	2.6157	-2.2070	-0.2493	-1.9577
150.00	-1.9440	-2.2046	-1.8267	-0.2606	-1.5662
152.00	-1.5502	-1.7551	-1.4237	-0.2049	-1.2188

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## CM MARSHALL STING 'C' RANGE

MACH= 1.100  
 ROLL= 0.00  
 ALPP= 145.0

ALPHA	CM MSUOC	CM MSNDC	CM MOHSC	DEL CM MM	CM MM
136.00	-0.6610	-0.4898	1.2694	0.1712	1.0982
138.00	-1.0147	-0.7724	1.0779	0.2423	0.8356
140.00	-1.3483	-1.1290	0.5682	0.2193	0.3488
142.00	-1.6518	-1.5277	-0.0013	0.1242	-0.1255
144.00	-1.9239	-1.8442	-0.5612	0.0797	-0.6409
146.00	-2.0995	-1.9321	-1.0614	0.1674	-1.2209
148.00	-2.4875	-2.3543	-1.4805	0.1332	-1.6137
150.00	-2.5520	-2.4242	-1.7838	0.1278	-1.9188
152.00	-2.4042	-2.4395	-1.8683	-0.0353	-1.8330

TABLE D- 77

MACH= 1.200  
 ROLL= 0.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MMH	CM MMH
136.00	2.6205	2.4826	4.2098	-0.1380	4.3477
138.00	2.0708	2.0387	3.6991	-0.0321	3.7312
140.00	1.5420	1.6078	3.1514	0.0658	3.0857
142.00	1.0083	1.1356	2.4301	0.1273	2.3028
144.00	0.5519	0.7078	1.7346	0.1559	1.5787
146.00	0.2977	0.4583	1.2186	0.1606	1.0580
148.00	-0.1361	0.0942	0.8094	0.2304	0.5790
150.00	-0.5325	-0.1178	0.4783	0.2147	0.2635
152.00	-0.9087	-0.4967	0.1228	0.4120	-0.2892

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MACH= 1.460  
 ROLL= 0.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MMH	CM MMH
136.00	4.5495	4.1321	5.2316	-0.4174	5.6490
138.00	4.1166	3.7298	4.9290	-0.3868	5.3158
140.00	3.5872	3.2923	4.4811	-0.2949	4.7759
142.00	2.9131	2.7487	3.9488	-0.1643	4.1132
144.00	2.3178	2.2454	3.2509	-0.0724	3.3233
146.00	1.7342	1.7768	2.6225	0.0426	2.5799
148.00	1.2465	1.2942	2.1484	0.0477	2.1008
150.00	0.9466	0.9704	2.0098	0.0238	1.9860
152.00	0.6863	0.6571	1.8521	0.0508	1.8013

TABLE D- 78

MACH= 0.600  
 ROLL= 45.00  
 HOPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	-4.1024	-2.9155	-2.0395	1.1870	-3.2265
138.00	-3.9343	-2.7414	-1.8672	1.1928	-3.0600
140.00	-3.4080	-2.3531	-1.3904	1.0548	-2.4452
142.00	-3.0136	-2.0651	-0.8547	0.9485	-1.8032
144.00	-2.8023	-1.8780	-0.6337	0.9243	-1.5581
146.00	-2.6107	-1.7206	-0.4445	0.8901	-1.3346
148.00	-2.4289	-1.5746	-0.5408	0.8544	-1.3952
150.00	-2.2652	-1.4637	-0.6613	0.8014	-1.4628
152.00	-2.1117	-1.3672	-0.6661	0.7444	-1.4106

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MACH= 0.800  
 ROLL= 45.00  
 ALPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	-3.9952	-3.6889	-2.2958	0.3064	-2.6022
138.00	-4.1323	-3.7528	-2.2160	0.3796	-2.5955
140.00	-3.7155	-3.3316	-2.3701	0.3839	-2.7540
142.00	-3.0547	-2.6036	-2.1885	0.3711	-2.5596
144.00	-2.7350	-2.3859	-1.8852	0.3492	-2.2343
146.00	-2.3935	-2.0575	-1.4855	0.3360	-1.8214
148.00	-2.0933	-1.7835	-1.4005	0.3099	-1.7104
150.00	-1.8749	-1.5411	-1.3225	0.3338	-1.6562
152.00	-1.7315	-1.3513	-1.2632	0.3803	-1.6435

TABLE D- 79

MACH= 0.900  
 ROLL= 45.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	-3.5733	-3.8829	-3.7377	-0.3096	-3.4281
138.00	-3.4731	-3.6526	-3.2216	-0.1795	-3.0421
140.00	-3.3329	-3.4730	-2.7588	-0.1401	-2.6187
142.00	-2.9254	-3.0073	-2.3964	-0.0819	-2.3145
144.00	-2.5487	-2.6614	-2.0627	-0.1127	-1.9500
146.00	-2.2279	-2.2755	-1.7805	-0.0476	-1.7329
148.00	-1.8926	-1.8842	-1.5936	0.0084	-1.6020
150.00	-1.5527	-1.3923	-1.2762	0.1605	-1.4367
152.00	-1.2436	-0.9755	-0.8858	0.2680	-1.1538

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MACH= 1.050  
 ROLL= 45.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	-4.5532	-4.6380	-3.2250	-0.0847	-3.1402
138.00	-4.6195	-4.7897	-3.6148	-0.1402	-3.4747
140.00	-4.7775	-5.0085	-4.2660	-0.2310	-4.0350
142.00	-4.7217	-4.9558	-4.5901	-0.2342	-4.3560
144.00	-4.3037	-4.5163	-4.2933	-0.2126	-4.0807
146.00	-3.6477	-3.9969	-3.7956	-0.3492	-3.4464
148.00	-3.5745	-3.8627	-3.5094	-0.2882	-3.2212
150.00	-3.1976	-3.3893	-3.1501	-0.1917	-2.9584
152.00	-2.7272	-2.8571	-2.6437	-0.1299	-2.5138

TABLE D- 80

MACH= 1.100  
 ROLL= 45.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSS00C	CM MSSNDC	CM MOHISC	DEL CM MM	CM MM
136.00	-2.0106	-2.0358	-0.0037	-0.0252	0.0215
138.00	-2.4310	-2.4119	-0.3348	0.0191	-0.3539
140.00	-2.7238	-2.7464	-0.8215	-0.0226	-0.7989
142.00	-2.0531	-2.9174	-1.3167	-0.0643	-1.2524
144.00	-3.1626	-3.2023	1.6402	-0.0397	-1.6004
146.00	-3.3244	-3.4599	2.2116	-0.1354	-2.0762
148.00	-3.4996	-3.5506	-2.8842	-0.0511	-2.8331
150.00	-3.6393	-3.6634	-3.0913	-0.0241	-3.0672
152.00	-3.6475	-3.5603	-3.0831	0.0072	-3.1702

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MACH= 1.200  
 ROLL= 45.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSS00C	CM MSSNDC	CM MOHISC	DEL CM MM	CM MM
136.00	1.6152	1.2278	2.6945	-0.7874	3.0819
138.00	1.0300	0.7335	2.0528	-0.2965	2.3494
140.00	0.5125	0.4016	1.5707	-0.1109	1.6816
142.00	0.1777	0.2207	1.2993	0.0430	1.2563
144.00	-0.2024	-0.1337	0.9966	0.0648	0.9278
146.00	-0.7404	-0.6426	0.3955	0.0978	0.2977
148.00	-1.0083	-0.9066	-0.2504	0.0217	-0.2721
150.00	-1.2369	-1.0615	-0.6445	0.1754	-0.8199
152.00	-1.5426	-1.4354	-1.0096	0.1072	-1.1168

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TABLE D- 81

MACH= 1.460  
ROLL= 45.00  
ALPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MSS00C	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	3.6291	3.0539	4.2352	-0.5753	4.8104
138.00	3.2648	2.7857	3.9612	-0.4791	4.4403
140.00	2.7631	2.4106	3.5632	-0.3526	3.9158
142.00	2.2028	1.9722	3.1021	-0.2306	3.3327
144.00	1.6412	1.4814	2.5635	-0.1599	2.7233
146.00	1.0277	0.9817	1.9244	-0.0460	1.9704
148.00	0.4588	0.4975	1.2818	0.0387	1.2431
150.00	0.0117	0.0245	0.7333	0.0128	0.7205
152.00	-0.3824	-0.3937	0.2317	-0.0113	0.2429

MACH= 0.600  
ROLL= 90.00  
ALPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MSS00C	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	-4.9298	-3.2559	-3.1134	1.6739	-4.7873
138.00	-4.6260	-3.0387	-2.7092	1.5873	-4.2965
140.00	-4.2405	-2.8004	-2.3708	1.4401	-3.8109
142.00	-3.8940	-2.5918	-2.1330	1.3022	-3.4352
144.00	-3.5537	-2.3627	-1.9550	1.1910	-3.1450
146.00	-3.1544	-2.0541	-1.6431	1.1003	-2.7434
148.00	-2.7880	-1.7920	-1.4402	0.9960	-2.4362
150.00	-2.4716	-1.5467	-1.2791	0.9250	-2.2040
152.00	-2.2163	-1.3409	-1.1169	0.8754	-1.9922



TABLE D- 82

MACH= 0.800  
 ROLL= 90.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	-5.1463	-4.4983	-3.0946	0.6480	-3.7426
138.00	-5.0957	-4.5580	-3.4247	0.5378	-3.9625
140.00	-4.7858	-4.2434	-3.5142	0.5424	-4.0567
142.00	-4.1928	-3.6615	-3.1065	0.5313	-3.6378
144.00	-3.5255	-3.0486	-2.5057	0.4769	-2.9826
146.00	-2.9217	-2.5072	-1.9564	0.4145	-2.3709
148.00	-2.5150	-2.1339	-1.7305	0.3812	-2.1117
150.00	-2.1304	-1.7400	-1.4311	0.	-1.8214
152.00	-1.7950	-1.3782	-1.2068	0.4167	-1.6236

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MACH= 0.900  
 ROLL= 90.00  
 ALPP= 145.0

## CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	-4.5130	-4.4566	-3.7675	0.0564	-3.8239
138.00	-3.9273	-4.1405	-3.2807	-0.2132	-3.0675
140.00	-3.8373	-4.0538	-3.0580	-0.2165	-2.8415
142.00	-3.5449	-3.7656	-2.6737	-0.2208	-2.4529
144.00	-3.0783	-3.2725	-2.2996	-0.1941	-2.1055
146.00	-2.5558	-2.6703	-1.9923	-0.1145	-1.8778
148.00	-2.2225	-2.2384	-1.7221	-0.0159	-1.7062
150.00	-1.7624	-1.7037	-1.3341	0.0587	-1.3928
152.00	-1.2529	-1.1303	-0.8987	0.1226	-1.0213

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TABLE D- 83

MACH= 1.050  
ROLL= 90.00  
ALPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	-3.8905	-4.0977	-3.0742	-0.2073	-2.0669
138.00	-4.1056	-4.4515	-3.5852	-0.3460	-3.2392
140.00	-4.3744	-4.7366	-3.9119	-0.3622	-3.5497
142.00	-4.5182	-4.8007	-4.2928	-0.2825	-4.0103
144.00	-4.5669	-4.4799	-4.0875	0.0870	-4.1745
146.00	-3.9005	-3.7504	-3.4997	0.1501	-3.6498
148.00	-3.2922	-3.4364	-3.2309	-0.1443	-3.0866
150.00	-2.9228	-3.0811	-2.9073	-0.1503	-2.7490
152.00	-2.7570	-2.8118	-2.5441	-0.0548	-2.4893

MACH= 1.100  
ROLL= 90.00  
ALPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	-1.0769	-1.1425	0.5507	-0.0656	0.6163
138.00	-1.5902	-1.6483	0.0083	-0.0581	0.0664
140.00	-2.0066	-2.1314	-0.4597	-0.1249	-0.3348
142.00	-2.3124	-2.6064	-1.0293	-0.2939	-0.7354
144.00	-2.5692	-2.9061	-1.5726	-0.3369	-1.2358
146.00	-2.7776	-3.0954	-2.0775	-0.3178	-1.7596
148.00	-2.9363	-3.2324	-2.4764	-0.2961	-2.1803
150.00	-2.9795	-3.2446	-2.7071	-0.2651	-2.4420
152.00	-3.1438	-3.3895	-2.8713	-0.2457	-2.6256

TABLE D- 84

MACH= 1.200  
 ROLL= 90.00  
 ALPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	2.3725	1.8103	3.2920	-0.5622	3.8542
138.00	1.0547	1.2643	2.6481	-0.3904	3.0385
140.00	1.0019	0.8055	1.8882	-0.1964	2.0847
142.00	0.5707	0.5020	1.4206	-0.0686	1.4892
144.00	0.1322	0.1951	0.9303	0.0630	0.8673
146.00	-0.2531	-0.2424	0.4180	0.0107	0.4073
148.00	-0.5069	-0.5840	0.0176	-0.0771	0.6947
150.00	-0.7698	-0.8826	-0.3172	-0.1128	-0.2044
152.00	-1.0754	-1.2789	-0.6709	-0.2036	-0.4672

ORIGINAL PAGE IS  
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MACH= 1.460  
 ROLL= 90.00  
 ALPP= 145.0

CM MARSHALL STING 'C' RANGE

ALPHA	CM MSSOOC	CM MSSNDC	CM MOONSC	DEL CM MM	CM MM
136.00	4.0215	3.5260	4.6764	-0.4955	5.1719
138.00	3.8680	3.3677	4.4705	-0.5003	4.9708
140.00	3.5126	3.0645	4.0861	-0.4481	4.5342
142.00	3.0194	2.6786	3.6258	-0.3408	3.9667
144.00	2.3646	2.1310	3.0658	-0.2336	3.2994
146.00	1.6440	1.5413	2.4331	-0.1027	2.5358
148.00	0.9004	0.8966	1.7883	-0.0039	1.7921
150.00	0.2775	0.3154	1.2016	0.0380	1.1637
152.00	-0.1484	-0.2015	0.6759	-0.0532	0.7290

TABLE D- 85

MACH= 0.600  
 ROLL= 0.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSOOC	CY MSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	-5.1189	-5.0327	-3.9623	0.0861	-4.0485
138.00	-4.5430	-4.3775	-4.3766	0.1655	-4.5421
140.00	-3.9051	-3.7340	-4.1867	0.1711	-4.3578
142.00	-3.2389	-3.0692	-3.5636	0.1697	-3.7333
144.00	-2.7221	-2.5371	-2.8871	0.1850	-3.0722
146.00	-2.2727	-2.0762	-2.3337	0.1965	-2.5301
148.00	-1.9767	-1.8043	-1.9925	0.1724	-2.1649
150.00	-1.6714	-1.5548	-1.6236	0.1167	-1.7403
152.00	-1.2643	-1.2527	-1.2113	0.0116	-1.2229

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.800  
 ROLL= 0.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSOOC	CY MSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	-3.8296	-3.6956	-3.3919	0.1340	-3.2260
138.00	-3.8539	-3.5763	-3.3901	0.2776	-3.6677
140.00	-3.8201	-3.3529	-3.3131	0.4672	-3.7803
142.00	-3.6990	-3.0679	-3.1498	0.6311	-3.7809
144.00	-3.3013	-2.8346	-2.8873	0.4666	-3.3540
146.00	-2.9097	-2.6099	-2.5471	0.2998	-2.8470
148.00	-2.6743	-2.4508	-2.2970	0.2235	-2.5205
150.00	-2.2475	-2.0862	-1.9237	0.1614	-2.0851
152.00	-1.7170	-1.5964	-1.5103	0.1214	-1.6323

TABLE D- A6

MACH= 0.900  
 ROLL= 0.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSNDC	CY MODISC	DEL CY MM	CY MM
136.00	-2.4203	-2.4959	-2.0333	-0.0756	-1.9577
138.00	-2.9448	-2.9248	-2.1369	0.0199	-2.1568
140.00	-3.0774	-2.9343	-2.2303	0.1430	-2.3739
142.00	-2.8217	-2.3877	-2.2543	0.4339	-2.6883
144.00	-2.5413	-2.1844	-2.2043	0.3569	-2.5612
146.00	-2.3001	-2.0258	-2.1596	0.2703	-2.4298
148.00	-2.2477	-1.9791	-2.0506	0.2686	-2.3191
150.00	-1.9837	-1.7343	-1.7699	0.494	-2.0193
152.00	-1.6357	-1.4246	-1.4590	.	-1.6700

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.050  
 ROLL= 0.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSNDC	CY MODISC	DEL CY MM	CY MM
136.00	-1.7002	-1.6866	-1.4704	0.0136	-1.4840
138.00	-1.6663	-1.6536	-1.4268	0.0126	-1.4395
140.00	-1.6886	-1.6901	-1.4112	-0.0015	-1.4097
142.00	-1.6385	-1.6405	-1.3440	-0.0020	-1.3420
144.00	-1.4202	-1.4147	-1.2402	0.0136	-1.2538
146.00	-1.4351	-1.3920	-1.1777	0.0432	-1.2209
148.00	-1.3177	-1.2625	-1.1362	0.0552	-1.1914
150.00	-1.1498	-1.0213	-1.0085	0.1285	-1.1370
152.00	-0.9970	-0.7904	-0.8312	0.2065	-1.0378

TABLE D- 87

MACH= 1.100  
 ROLL= 0.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	MSJOC	CY MSJDC	CY MOJNSC	DEL CY MM	CY MM
136.00	-1.6688	-1.6530	-1.4996	0.0158	-1.5154
138.00	-1.5456	-1.5260	-1.4586	0.0196	-1.4782
140.00	-1.4627	-1.4590	-1.3832	0.0037	-1.3870
142.00	-1.3907	-1.3718	-1.2534	0.0189	-1.2723
144.00	-1.2687	-1.1989	-1.1305	0.0098	-1.2202
146.00	-1.2723	-1.2206	-1.1063	0.0516	-1.1579
148.00	-1.3356	-1.3426	-1.1622	-0.0070	-1.1552
150.00	-1.1757	-1.2582	-1.0051	-0.0025	-1.0026
152.00	-0.6605	-0.5998	-0.8044	0.0607	-0.8651

ORIGINAL PAGE IS  
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MACH= 1.200  
 ROLL= 0.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	MSJOC	CY MSJDC	CY MOJNSC	DEL CY MM	CY MM
136.00	-1.6884	-1.7040	-1.3805	-0.0155	-1.3650
138.00	-1.5558	-1.5432	-1.3870	0.0125	-1.3995
140.00	-1.3794	-1.3437	-1.3344	0.0357	-1.3702
142.00	-1.2026	-1.1715	-1.2330	0.0311	-1.2649
144.00	-1.1161	-1.0890	-1.1210	0.0271	-1.1480
146.00	-1.1794	-1.1553	-1.0830	0.0241	-1.1079
148.00	-1.3605	-1.3554	-1.1523	0.0050	-1.1574
150.00	-1.5651	-1.5754	-1.2607	-0.0103	-1.2504
152.00	-1.1059	-1.0956	-1.1353	0.0103	-1.1456

TABLE D- 88

MACH= 1.450  
 ROLL= 0.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSHDC	CY MOONSC	DEL CY MM	CY MM
136.00	-1.0271	-1.0736	-0.7321	-0.0465	-0.6856
138.00	-1.0311	-1.0725	-0.7499	-0.0415	-0.7084
140.00	-0.9933	-1.0273	-0.7456	-0.0340	-0.7117
142.00	-0.9449	-0.9727	-0.7335	-0.0278	-0.7057
144.00	-0.9092	-0.9204	-0.7022	-0.0112	-0.6910
146.00	-0.9117	-0.9268	-0.6592	-0.0151	-0.6441
148.00	-1.0324	-1.0356	-0.6521	-0.0032	-0.6489
150.00	-1.2366	-1.2233	-0.7453	-0.0134	-0.7586
152.00	-1.1312	-1.2171	-0.9096	-0.0058	-0.8238

MACH= 0.600  
 ROLL= 45.00  
 ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSHDC	CY MOONSC	DEL CY MM	CY MM
136.00	-2.6038	-2.1909	-1.9232	0.4129	-2.3360
138.00	-2.4551	-1.9638	-1.6762	0.4913	-2.1675
140.00	-2.3445	-1.8591	-1.3056	0.4854	-1.7910
142.00	-2.3272	-1.8709	-1.0082	0.4562	-1.5445
144.00	-2.0920	-1.7616	-0.9203	0.3304	-1.2507
146.00	-1.6809	-1.5140	-0.8276	0.1669	-0.9945
148.00	-1.3478	-1.3054	-0.8495	0.0424	-0.8920
150.00	-1.1154	-1.1445	-0.8870	-0.0291	-0.9579
152.00	-0.9578	-1.0102	-0.8900	-0.0524	-0.8456

ORIGINAL PAGE IS  
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TABLE D- 89

MACH= 0.800  
ROLL= 45.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	-1.0572	-0.9997	0.2518	0.0575	0.1943
138.00	-1.4422	-1.2754	0.0423	0.1668	-0.1245
140.00	-1.5468	-1.4526	-0.0261	0.0942	-0.1203
142.00	-1.6243	-1.5736	-0.0343	0.0507	-0.0850
144.00	-1.5256	-1.5272	-0.0773	-0.0016	-0.0757
146.00	-1.3474	-1.3567	-0.0777	-0.0092	-0.0685
148.00	-1.1726	-1.2016	-0.0900	-0.0290	-0.0610
150.00	-0.9761	-1.0231	-0.0934	-0.0470	-0.0464
152.00	-0.8098	-0.8514	0.0501	-0.0416	0.0997

ORIGINAL  
OF POCAL QUALITY

MACH= 0.900  
ROLL= 45.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	-0.0489	-0.1437	0.8392	-0.0948	0.9340
138.00	-0.1748	-0.2543	0.7173	-0.0795	0.7968
140.00	-0.3521	-0.3902	0.5314	-0.0381	0.5695
142.00	-0.7570	-0.7542	0.3463	0.0028	0.3435
144.00	-0.8484	-0.8693	0.1780	-0.0210	0.1990
146.00	-0.7750	-0.8362	0.1565	-0.0612	0.2177
148.00	-0.7497	-0.7731	0.2019	-0.0234	0.2253
150.00	-0.7679	-0.7696	0.1612	-0.0017	0.1630
152.00	-0.7488	-0.6985	0.0991	0.0502	0.0489



TABLE D- 90

MACH= 1.050  
ROLL= 45.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	1.2285	1.1248	1.3036	-0.1037	1.4073
138.00	1.0503	0.9415	1.2192	-0.1069	1.3271
140.00	0.7015	0.6526	1.0236	-0.0469	1.0725
142.00	0.3839	0.3799	0.8022	-0.0040	0.8062
144.00	0.1942	0.2284	0.6341	0.0342	0.6000
146.00	0.0242	0.1992	0.5568	0.1750	0.3818
148.00	0.2034	0.3534	0.5156	0.1500	0.3656
150.00	0.0155	-0.0279	0.3483	-0.0434	0.3917
152.00	-0.4279	-0.4681	0.0436	-0.0402	0.0838

ORIGINAL PAGE IS  
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MACH= 1.100  
ROLL= 45.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	1.1204	1.0484	1.2739	-0.0720	1.3459
138.00	1.0616	0.9621	1.1876	-0.0395	1.2871
140.00	0.9015	0.7659	1.0440	-0.1356	1.1796
142.00	0.5970	0.4859	0.8775	-0.1111	0.9886
144.00	0.3919	0.3892	0.6913	-0.0026	0.6939
146.00	0.3382	0.4172	0.5970	0.0790	0.5180
148.00	0.1070	0.2806	0.4738	0.1736	0.3002
150.00	0.1283	0.1719	0.2580	0.0435	0.2145
152.00	-0.0805	-0.1031	0.2159	-0.0276	0.2436

TABLE D- 91

MACH= 1.200  
ROLL= 45.00  
ALPP= 145.0

CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	0.8400	0.7892	1.0815	-0.0508	1.1322
138.00	0.7431	0.6977	1.0064	-0.0454	1.0517
140.00	0.6295	0.5836	0.8942	-0.0459	0.9401
142.00	0.4494	0.3936	0.7595	-0.0557	0.8152
144.00	0.3449	0.2689	0.6775	-0.0759	0.7534
146.00	0.3989	0.2970	0.6341	-0.1019	0.7359
148.00	0.2348	0.3116	0.5449	0.0768	0.4681
150.00	0.2395	0.2977	0.3943	0.0582	0.3361
152.00	0.1423	0.1437	0.2871	0.0013	0.2858

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 1.460  
ROLL= 45.00  
ALPP= 145.0

CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	0.9297	0.8900	1.0261	-0.0397	1.0657
138.00	0.8148	0.7737	0.9424	-0.0411	0.9835
140.00	0.7146	0.6725	0.8722	-0.0421	0.9143
142.00	0.6346	0.5949	0.8085	-0.0397	0.8483
144.00	0.5919	0.5497	0.7411	-0.0422	0.7833
146.00	0.5343	0.5008	0.6670	-0.0335	0.7005
148.00	0.4917	0.4754	0.6034	-0.0163	0.6197
150.00	0.5533	0.5724	0.5705	0.0191	0.5515
152.00	0.5741	0.6214	0.5707	0.0473	0.5234

MACH= 0.600  
ROLL= 90.00  
ALPP= 145.0

CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	0.0737	0.0274	-0.1612	-0.0463	-0.1149
138.00	0.0463	-0.0155	-0.2335	-0.0638	-0.1697
140.00	-0.0034	-0.0589	-0.2331	-0.0554	-0.1776
142.00	-0.0257	-0.0736	-0.1618	-0.0478	-0.1140
144.00	-0.0633	-0.1190	-0.0776	-0.0587	-0.0189
146.00	-0.1502	-0.2110	-0.1075	-0.0608	-0.0467
148.00	-0.2039	-0.2255	-0.0844	-0.0216	-0.0628
150.00	-0.2541	-0.2740	-0.1326	-0.0199	-0.1127
152.00	-0.2954	-0.3320	-0.1895	-0.0366	-0.1529

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MACH= 0.800  
ROLL= 90.00  
ALPP= 145.0

CY MARSHALL STING 'C' RANGE

ALPHA	CY MSS00C	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	0.2603	0.2741	0.3362	0.0138	0.3224
138.00	0.2322	0.2387	0.2788	0.0065	0.2724
140.00	0.2027	0.2834	0.2450	0.0007	0.2443
142.00	0.3080	0.2734	0.2282	-0.0345	0.2627
144.00	0.1311	0.0898	0.1203	-0.0413	0.1616
146.00	-0.0883	-0.0918	-0.0214	-0.0035	-0.0179
148.00	-0.1521	-0.1486	0.0007	0.0035	-0.0029
150.00	-0.1662	-0.1558	-0.0073	0.0103	-0.0176
152.00	-0.2270	-0.2081	-0.0845	0.0189	-0.1033

TABLE D- 93

MACH= 0.900  
ROLL= 90.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSSOOC	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	0.0922	0.1019	0.0498	0.0097	0.0401
138.00	0.5093	0.5449	0.2250	0.0355	0.1894
140.00	0.4634	0.5015	0.4002	0.0381	0.3621
142.00	0.4966	0.5433	0.3529	0.0467	0.3062
144.00	0.3733	0.4212	0.3380	0.0479	0.2902
146.00	0.2033	0.1980	0.3663	-0.0053	0.3716
148.00	0.1421	0.1438	0.1813	0.0017	0.1796
150.00	0.1302	0.1168	0.1668	-0.0134	0.1802
152.00	0.0019	0.0110	0.1341	0.0122	0.1219

MACH= 1.050  
ROLL= 90.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSSOOC	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	-0.0775	-0.0585	0.0209	0.0190	0.0020
138.00	-0.0546	-0.0290	0.0330	0.0257	0.0073
140.00	-0.0299	-0.0064	0.0412	0.0235	0.0177
142.00	-0.0062	0.0067	0.0553	0.0129	0.0424
144.00	-0.0012	0.0010	0.0836	0.0022	0.0814
146.00	-0.1282	-0.1178	0.0968	0.0104	0.0864
148.00	-0.2218	-0.1805	0.0241	0.0413	-0.0173
150.00	-0.2503	-0.1572	-0.0735	0.0930	-0.1666
152.00	0.0676	0.1581	0.0770	0.0906	-0.0136

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TABLE D- 94

MACH= 1.100  
ROLL= 90.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSSOOC	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	-0.0637	-0.0363	0.0862	0.0274	0.0588
138.00	-0.0859	-0.0649	0.0873	0.0209	0.0623
140.00	-0.0868	-0.0748	0.0710	0.0120	0.0590
142.00	-0.0335	-0.0243	0.0627	0.0092	0.0535
144.00	0.0623	0.0940	0.0767	0.0318	0.0150
146.00	0.0257	0.0541	0.1193	0.0265	0.0939
148.00	-0.0227	0.0299	0.1681	0.0526	0.1155
150.00	0.1037	0.1160	0.1862	0.0123	0.1739
152.00	0.0945	0.0835	0.1684	-0.0110	0.1794

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MACH= 1.200  
ROLL= 90.00  
ALPP= 145.0

## CY MARSHALL STING 'C' RANGE

ALPHA	CY MSSOOC	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	-0.0601	-0.0536	0.0259	0.0064	0.0195
138.00	-0.0607	-0.0545	0.0457	0.0062	0.0395
140.00	-0.0825	-0.0602	0.0503	0.0222	0.0281
142.00	-0.1310	-0.0993	0.0271	0.0316	-0.0045
144.00	-0.0959	-0.0743	0.0380	0.0216	0.0164
146.00	0.0293	0.0602	0.0748	0.0309	0.0438
148.00	-0.0946	-0.0363	0.0821	0.0583	0.0239
150.00	0.0327	0.0872	0.0832	0.0545	0.0287
152.00	0.1150	0.1283	0.1411	0.0132	0.1279

TABLE D- 95

CY MARSHALL STING 'C' RANGE

MACH= 1.460  
ROLL= 90.00  
ALPP= 145.0

ALPHA	CY MSS00C	CY MSSNDC	CY MOONSC	DEL CY MM	CY MM
136.00	0.0773	0.0685	0.1574	-0.0087	0.1662
138.00	0.0658	0.0587	0.1466	-0.0070	0.1536
140.00	0.0368	0.0374	0.1391	0.0007	0.1385
142.00	0.0145	0.0191	0.1308	0.0045	0.1263
144.00	0.0247	0.0317	0.1145	0.0070	0.1075
146.00	0.0642	0.0707	0.1031	0.0065	0.0967
148.00	0.1911	0.2001	0.1360	0.0090	0.1278
150.00	0.2299	0.2495	0.2253	0.0196	0.2057
152.00	0.2845	0.3001	0.3123	0.0156	0.2967

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CYM MARSHALL STING 'C' RANGE

MACH= 0.600  
ROLL= 0.00  
ALPP= 145.0

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	-2.6286	-3.1295	0.3132	-0.5009	0.8140
138.00	-2.2096	-2.3621	-1.6778	-0.1525	-1.5253
140.00	-1.0037	-1.9168	-2.7234	-0.1131	-2.6103
142.00	-1.6843	-1.6498	-2.4827	0.0345	-2.5172
144.00	-1.4146	-1.4468	-1.9714	-0.0321	-1.9393
146.00	-1.3473	-1.3081	-1.5205	0.0392	-1.5597
148.00	-1.0814	-0.9549	-0.9704	0.1264	-1.0969
150.00	-0.6993	-0.5866	-0.5760	0.1127	-0.6887
152.00	-0.6925	-0.5745	-0.7705	0.1180	-0.8965

TABLE D- 96

WACH= 0.000  
 ROLL= 0.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MS300C	CYM MS3NDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	-1.3841	-1.6303	-1.4545	-0.2452	-1.2083
138.00	-1.1578	-1.3168	-1.4056	-0.1589	-1.2466
140.00	-1.0089	-0.8338	-1.4224	0.1751	-1.5975
142.00	-0.8491	-0.4592	-1.4930	0.3859	-1.8829
144.00	-0.5799	-0.2833	-1.3233	0.2966	-1.6199
146.00	-0.6334	-0.4034	-0.9465	0.2300	-1.1765
148.00	-0.5131	-0.2947	-0.3677	0.2184	-0.5862
150.00	-0.4895	-0.3234	-0.2159	0.1661	-0.3820
152.00	-0.6520	-0.4604	-0.4892	0.1917	-0.6809

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WACH= 0.900  
 ROLL= 0.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MS300C	CYM MS3NDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	-1.2644	-1.5163	-1.3232	-0.2519	-1.0714
138.00	-1.4651	-1.6244	-1.3285	-0.1593	-1.1691
140.00	-1.6047	-1.5957	-1.2568	0.0090	-1.2678
142.00	-1.3622	-1.1785	-1.2344	0.1837	-1.4181
144.00	-0.9210	-0.7639	-1.2505	0.1571	-1.4076
146.00	-0.6168	-0.3720	-1.0695	0.2448	-1.3143
148.00	-0.4182	-0.0888	-0.6417	0.3293	-0.9710
150.00	-0.4873	-0.1767	-0.3427	0.3106	-0.6532
152.00	-0.7054	-0.3879	-0.3962	0.3176	-0.7137

TABLE D- 97

MACH= 1.050  
ROLL= 0.00  
ALPP= 145.0

CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	-0.1788	-0.3046	-0.4623	-0.1258	-0.3365
138.00	-0.2142	-0.3595	-0.4716	-0.1453	-0.3263
140.00	-0.3496	-0.4576	-0.4667	-0.1001	-0.3587
142.00	-0.4850	-0.5139	-0.4589	-0.0289	-0.4300
144.00	-0.7490	-0.7038	-0.6067	0.0451	-0.6519
146.00	-0.9598	-0.7578	-0.7634	0.2020	-0.9654
148.00	-0.9270	-0.6813	-0.7821	0.2457	-1.0277
150.00	-0.5624	-0.2176	-0.6890	0.3448	-1.0339
152.00	-0.3954	0.0466	-0.4265	0.4420	-0.8685

MACH= 1.100  
ROLL= 0.00  
ALPP= 145.0

CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	-0.1794	-0.3267	-0.5652	-0.1473	-0.4178
138.00	-0.0307	-0.1395	-0.6134	-0.1087	-0.5047
140.00	-0.0010	-0.1501	-0.6739	-0.0691	-0.6047
142.00	-0.2147	-0.2733	-0.5953	-0.0586	-0.5366
144.00	-0.4774	-0.5088	-0.6730	-0.0314	-0.6416
146.00	-0.6431	-0.5702	-0.5281	0.0729	-0.6010
148.00	-0.5987	-0.4892	-0.2789	0.1095	-0.3804
150.00	-0.6415	-0.1743	-0.3806	0.4672	-0.0478
152.00	-0.2122	0.0562	-0.6162	0.2685	-0.8847

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TABLE D- 98

MACH= 1.200  
 ROLL = 0.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	-0.6564	-0.7187	-0.6193	-0.0623	-0.5571
138.00	-0.4105	-0.3997	-0.6206	0.0108	-0.6314
140.00	-0.2522	-0.1894	-0.7654	0.0628	-0.8281
142.00	-0.3339	-0.2441	-0.8113	0.0898	-0.9011
144.00	-0.5923	-0.5022	-0.7896	0.0900	-0.8796
146.00	-0.6778	-0.6008	-0.7021	0.0771	-0.7792
148.00	-0.6906	-0.7590	-0.4805	-0.0684	-0.3321
150.00	-0.7632	-0.7542	-0.1240	0.0090	-0.1333
152.00	-0.5496	-0.4267	-0.4506	0.1229	-0.5736

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MACH= 1.460  
 ROLL = 0.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	-1.0908	-1.1492	-0.9296	-0.0585	-0.8712
138.00	-1.0444	-1.0736	-0.8772	-0.0292	-0.8480
140.00	-0.9535	-0.9825	-0.8125	-0.0289	-0.7836
142.00	-0.8390	-0.8648	-0.8082	-0.0258	-0.7824
144.00	-0.8377	-0.8472	-0.7568	-0.0095	-0.7472
146.00	-0.9103	-0.9314	-0.6664	-0.0211	-0.6453
148.00	-1.0040	-1.0363	-0.4660	-0.0323	-0.4337
150.00	-0.9789	-0.9869	0.0116	-0.0080	0.0195
152.00	-0.7105	-0.9287	0.2244	-0.2182	0.4426

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TABLE D- 99

MACH= 0.600  
ROLL= 45.00  
ALPP= 145.0

CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSSOOC	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	-3.4403	-3.4482	-2.1945	-0.0079	-2.1866
138.00	-3.4141	-2.7988	-1.7271	0.6153	-2.3424
140.00	-3.5634	-2.8418	-1.2924	0.1216	-2.0139
142.00	-3.5819	-2.9984	-0.3786	0.6736	-1.0522
144.00	-2.9699	-2.5298	0.3497	0.4401	-0.0904
146.00	-2.1961	-2.0122	0.3908	0.1839	0.2068
148.00	-1.3538	-1.3879	0.0203	-0.0341	0.0544
150.00	-0.8190	-0.9613	-0.3955	-0.1423	-0.2535
152.00	-0.7458	-0.8629	-0.9227	-0.1170	-0.8057

MACH= 0.800  
ROLL= 45.00  
ALPP= 145.0

CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSSOOC	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	-1.4927	-1.4682	-1.1131	0.0145	-1.1376
138.00	-1.2923	-1.1237	-0.9807	0.1686	-1.1493
140.00	-1.3059	-1.2537	-1.2332	0.0422	-1.2754
142.00	-2.3194	-2.3312	-1.0595	-0.0118	-1.0477
144.00	-2.0250	-2.0221	-0.5302	0.0029	-0.5231
146.00	-1.5902	-1.5959	0.0316	-0.0057	0.0373
148.00	-0.9082	-1.0151	0.1320	-0.0269	0.1589
150.00	-0.5804	-0.6350	0.0445	-0.0546	0.0991
152.00	-0.4241	-0.4393	-0.0761	-0.0152	-0.0609

TABLE D-100

MACH= 0.900  
 ROLL= 45.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	-1.2708	-1.0897	-0.5889	0.1811	-0.7700
138.00	-0.5844	-0.4806	-0.5663	0.1039	-0.6701
140.00	-0.2409	-0.2732	-0.4369	-0.0322	-0.4046
142.00	-0.9557	-1.0367	-0.4519	-0.0810	-0.3709
144.00	-0.9425	-0.9337	-0.2410	0.0089	0.2499
146.00	-1.0336	-1.0280	0.1053	0.0056	0.0996
148.00	-0.7961	-0.7733	0.0427	0.0228	0.0199
150.00	-0.5130	-0.4424	0.1002	0.0706	0.0296
152.00	-0.3979	-0.2704	-0.0658	0.1276	-0.1933

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MACH= 1.050  
 ROLL= 45.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	1.6496	1.5243	1.5481	-0.1252	1.6733
138.00	1.4395	1.2622	1.3301	-0.1773	1.5074
140.00	0.8834	0.7106	1.0748	-0.1728	1.2476
142.00	0.3757	0.2943	0.5722	-0.0813	0.6535
144.00	0.0184	0.1334	-0.0224	0.1150	-0.1374
146.00	-0.4598	-0.3459	-0.4366	0.1139	-0.5505
148.00	0.1102	0.1550	-0.3490	0.0448	-0.3938
150.00	0.0051	0.1054	0.2368	0.1003	0.1365
152.00	-0.0210	0.1201	0.2818	0.1411	0.1407

C-3

TABLE D-101

MACH= 1.100  
 ROLL= 45.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSSOOC	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	1.7905	1.5821	1.8762	-0.2084	2.0846
138.00	1.7350	1.4786	1.7060	-0.2564	1.9624
140.00	1.5441	1.2183	1.6049	-0.3250	1.9307
142.00	1.1759	0.8498	1.6067	-0.3261	1.9328
144.00	0.6625	0.5429	1.5104	-0.1196	1.6300
146.00	-0.0585	-0.1260	1.0744	-0.0675	1.1419
148.00	-0.0033	-0.0042	0.6194	-0.0009	0.6203
150.00	0.3061	0.3774	0.6710	0.0713	0.5997
152.00	0.1796	0.2777	0.9447	0.0980	0.8467

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MACH= 1.200  
 ROLL= 45.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSSOOC	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	1.5988	1.3781	1.9006	-0.2207	2.1213
138.00	1.5092	1.3110	1.8709	-0.1982	2.0690
140.00	1.4224	1.2161	1.7804	-0.2053	1.9867
142.00	1.1962	0.9875	1.7371	-0.1986	1.9358
144.00	0.7788	0.6381	1.5562	-0.1407	1.6969
146.00	0.2924	0.1634	1.2823	-0.1291	1.4114
148.00	0.2481	0.2616	1.0464	0.0135	1.0330
150.00	0.4568	0.4978	0.7938	0.0410	0.7528
152.00	0.4175	0.4916	0.6650	0.0740	0.5909

TABLE D-102

MACH= 1.460  
ROLL= 45.00  
ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSSOOC	CYM MSSNDC	CYM MOONSC	DEL CYM MMH	CYM MMH
136.00	1.2339	1.0943	1.2073	-0.1396	1.3469
138.00	1.1760	1.0346	1.2017	-0.1414	1.3431
140.00	1.1129	0.9833	1.2075	-0.1297	1.3372
142.00	1.0342	0.9229	1.2324	-0.1113	1.3437
144.00	1.0166	0.9137	1.1819	-0.1030	1.2849
146.00	0.9686	0.9012	1.0713	-0.0674	1.1387
148.00	0.8874	0.7976	0.8661	-0.0098	0.8759
150.00	0.7107	0.8186	0.5695	0.1079	0.4616
152.00	0.7760	0.8934	0.3636	0.1174	0.2462

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MACH= 0.600  
ROLL= 90.00  
ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSSOOC	CYM MSSNDC	CYM MOONSC	DEL CYM MMH	CYM MMH
136.00	1.1618	1.0978	0.5578	-0.0641	0.6219
138.00	1.3512	1.2661	0.4694	-0.0951	0.5545
140.00	1.2445	1.1818	0.2995	-0.0627	0.3622
142.00	1.1959	1.0947	0.2336	-0.1012	0.3347
144.00	1.0684	0.8549	0.3252	-0.2135	0.5387
146.00	0.7525	0.6475	0.4556	-0.1051	0.5607
148.00	0.6778	0.6307	0.6647	-0.0471	0.7118
150.00	0.6617	0.6597	0.7546	-0.0020	0.7566
152.00	0.5618	0.5397	0.7453	-0.0220	0.7673

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TABLE D-103

MACH= 0.800  
 ROLL= 90.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MMH	CYM MMH
136.00	-0.2340	-0.0747	-0.3228	0.1592	-0.4821
138.00	0.1176	0.1660	-0.1085	0.0484	-0.2369
140.00	0.3599	0.4107	-0.0941	0.0508	-0.1449
142.00	0.6297	0.6578	-0.1296	0.0281	-0.1576
144.00	0.7367	0.7463	0.0451	0.0096	0.0355
146.00	0.4846	0.5604	0.3317	0.0758	0.2559
148.00	0.5342	0.5528	0.4963	0.0186	0.4777
150.00	0.5602	0.6272	0.6871	0.0670	0.6201
152.00	0.5226	0.6452	0.8358	0.1227	0.7132

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## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MMH	CYM MMH
136.00	0.1878	0.4776	0.0449	0.2897	-0.2448
138.00	0.0781	0.4050	-0.0560	0.3270	-0.3829
140.00	0.4108	0.7827	-0.0143	0.3718	-0.3861
142.00	0.6793	1.0049	0.0068	0.3256	-0.3188
144.00	0.6833	0.8685	-0.0610	0.1852	-0.2462
146.00	0.2524	0.4125	-0.0183	0.1602	-0.1785
148.00	0.4667	0.6524	0.1256	0.1857	-0.0601
150.00	0.6351	0.7560	0.4225	0.1208	0.3016
152.00	0.6685	0.8914	0.9100	0.2229	0.6871

MACH= 0.900  
 ROLL= 90.00  
 ALPP= 145.0

TABLE D-104

MACH= 1.050  
 ROLL= 90.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	0.3024	0.3922	0.3262	0.0899	0.2363
138.00	0.2945	0.3792	0.2658	0.0847	0.1811
140.00	0.2931	0.3932	0.2655	0.1002	0.1653
142.00	0.3471	0.4593	0.2541	0.1122	0.1420
144.00	0.4998	0.6610	0.1929	0.1613	0.0316
146.00	0.3668	0.5635	0.1404	0.2017	-0.0613
148.00	0.2053	0.5021	0.1346	0.2968	-0.1621
150.00	0.1232	0.5127	0.0102	0.3895	-0.3793
152.00	0.2724	0.5883	-0.3194	0.3160	-0.6354

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.100  
 ROLL= 90.00  
 ALPP= 145.0

## CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	0.3558	0.4598	0.2775	0.1040	0.1735
138.00	0.3040	0.3920	0.2932	0.0881	0.2051
140.00	0.3048	0.3013	0.4097	0.0765	0.3332
142.00	0.3695	0.4596	0.4207	0.0901	0.3307
144.00	0.4189	0.5606	0.3459	0.1416	0.2082
146.00	0.2456	0.3909	0.1849	0.1452	0.0397
148.00	0.2196	0.4236	-0.0608	0.2040	-0.2648
150.00	0.1641	0.3210	-0.2218	0.1568	-0.3786
152.00	0.3340	0.2879	-0.1576	-0.0461	-0.1114

ORIGINAL PAGE IS  
OF POOR QUALITY

TABLE D-105

MACH= 1.200  
ROLL= 90.00  
ALPP= 145.0

CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	0.4938	0.5551	0.2182	0.0613	0.1569
138.00	0.3703	0.4251	0.2297	0.0548	0.1749
140.00	0.3172	0.3766	0.3327	0.0594	0.2734
142.00	0.3474	0.4299	0.4756	0.0826	0.3930
144.00	0.3946	0.5034	0.3966	0.1088	0.2878
146.00	0.3388	0.4831	0.2293	0.1442	0.0851
148.00	0.2706	0.4763	0.1187	0.2058	-0.0870
150.00	0.3291	0.5943	-0.0081	0.2651	-0.2733
152.00	0.2514	0.4462	-0.0706	0.1947	-0.2653

MACH= 1.460  
ROLL= 90.00  
ALPP= 145.0

CYM MARSHALL STING 'C' RANGE

ALPHA	CYM MSS00C	CYM MSSNDC	CYM MOONSC	DEL CYM MM	CYM MM
136.00	0.2475	0.2442	0.2556	-0.0033	0.2588
138.00	0.2038	0.1955	0.2053	-0.0083	0.2136
140.00	0.1640	0.1780	0.1842	0.0139	0.1703
142.00	0.1686	0.1893	0.2150	0.0207	0.1943
144.00	0.1769	0.2232	0.2448	0.0463	0.1985
146.00	0.2129	0.2621	0.2309	0.0493	0.1817
148.00	0.2744	0.3679	0.0198	0.0934	-0.0736
150.00	0.3149	0.4532	-0.2317	0.1383	-0.3700
152.00	0.3299	0.5177	-0.2034	0.1878	-0.3913



TABLE D-106

MACH= 0.600  
 ROLL= 0.03  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSSOOC	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1749	-0.1141	0.0109	0.0608	-0.0498
138.00	-0.1555	-0.1174	0.0244	0.0381	-0.0137
140.00	-0.1556	-0.1218	0.0340	0.0338	0.0002
142.00	-0.1329	-0.1208	0.0418	0.0120	0.0298
144.00	-0.1200	-0.1158	0.0283	0.0042	0.0240
146.00	-0.0977	-0.1106	0.0328	-0.0129	0.0458
148.00	-0.0675	-0.0960	0.0427	-0.0206	0.0712
150.00	-0.0522	-0.0869	0.0421	-0.0347	0.0768
152.00	-0.0324	-0.0754	0.0597	-0.0430	0.1027

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.800  
 ROLL= 0.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSSOOC	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.0918	-0.1046	-0.0293	-0.0128	-0.0165
138.00	-0.0932	-0.1033	-0.0258	-0.0101	-0.0157
140.00	-0.0830	-0.1072	-0.0201	-0.0242	0.0041
142.00	-0.0786	-0.1058	-0.0138	-0.0272	0.0134
144.00	-0.0793	-0.1017	-0.0078	-0.0224	0.0146
146.00	-0.0688	-0.0978	-0.0060	-0.0289	0.0229
148.00	-0.0554	-0.0847	-0.0052	-0.0293	0.0241
150.00	-0.0461	-0.0773	0.0012	-0.0312	0.0324
152.00	-0.0405	-0.0681	0.0060	-0.0276	0.0336

TABLE D-107

MACH= 0.900  
 ROLL= 0.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSS00C	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1508	-0.1067	-0.0505	0.0441	-0.0946
138.00	-0.1441	-0.1001	-0.0442	0.0440	-0.0882
140.00	-0.1374	-0.0955	-0.0380	0.0419	-0.0799
142.00	-0.1331	-0.0958	-0.0304	0.0373	-0.0677
144.00	-0.1287	-0.0902	-0.0281	0.0385	-0.0666
146.00	-0.1184	-0.0803	-0.0192	0.0382	-0.0573
148.00	-0.1072	-0.0717	-0.0100	0.0355	-0.0455
150.00	-0.0979	-0.0626	-0.0053	0.0353	-0.0406
152.00	-0.0863	-0.0632	-0.0010	0.0231	-0.0249

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.050  
 ROLL= 0.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSS00C	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1276	-0.1207	-0.0946	0.0069	-0.1015
138.00	-0.1271	-0.1152	-0.0891	0.0119	-0.1011
140.00	-0.1259	-0.1069	-0.0794	0.0190	-0.0984
142.00	-0.1263	-0.0994	-0.0739	0.0269	-0.1007
144.00	-0.1223	-0.0926	-0.0672	0.0297	-0.0970
146.00	-0.0970	-0.0855	-0.0594	0.0116	-0.0710
148.00	-0.0690	-0.0688	-0.0516	0.0002	-0.0518
150.00	-0.0537	-0.0546	-0.0413	-0.0009	-0.0404
152.00	-0.0459	-0.0436	-0.0318	0.0023	-0.0341

TABLE D-108

MACH= 1.100  
 ROLL= 0.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSS00C	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1192	-0.1368	-0.1132	-0.0176	-0.0956
138.00	-0.1127	-0.1084	-0.1047	0.0043	-0.1090
140.00	-0.1077	-0.0997	-0.0944	0.0081	-0.1025
142.00	-0.1086	-0.0955	-0.0853	0.0131	-0.0984
144.00	-0.1079	-0.0933	-0.0705	0.0146	-0.0851
146.00	-0.1011	-0.0824	-0.0604	0.0176	-0.0780
148.00	-0.0865	-0.0706	-0.0584	0.0159	-0.0743
150.00	-0.0740	-0.0770	-0.0549	-0.0030	-0.0519
152.00	-0.0551	-0.0623	-0.0460	-0.0072	-0.0387

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.200  
 ROLL= 0.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSS00C	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1178	-0.1226	-0.1171	-0.0048	-0.1123
138.00	-0.1107	-0.1170	-0.1046	-0.0063	-0.0983
140.00	-0.1055	-0.1120	-0.0981	-0.0065	-0.0916
142.00	-0.1011	-0.1020	-0.0913	-0.0009	-0.0904
144.00	-0.0973	-0.0879	-0.0854	0.0094	-0.0949
146.00	-0.0917	-0.0760	-0.0728	0.0157	-0.0886
148.00	-0.0840	-0.0615	-0.0647	0.0224	-0.0872
150.00	-0.0742	-0.0554	-0.0634	0.0188	-0.0821
152.00	-0.0693	-0.0503	-0.0564	0.0191	-0.0755

TABLE D-109

MACH= 1.460  
ROLL= 0.00  
ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSS00C	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1358	-0.1174	-0.1158	0.0184	-0.1342
138.00	-0.1273	-0.1067	-0.1096	0.0206	-0.1302
140.00	-0.1200	-0.0988	-0.1014	0.0212	-0.1226
142.00	-0.1151	-0.0921	-0.0966	0.0229	-0.1196
144.00	-0.1044	-0.0825	-0.0921	0.0219	-0.1140
146.00	-0.0934	-0.0686	-0.0823	0.0249	-0.1072
148.00	-0.0838	-0.0606	-0.0697	0.0232	-0.0929
150.00	-0.0758	-0.0514	-0.0622	0.0244	-0.0866
152.00	-0.0821	-0.0423	-0.0571	0.0398	-0.0969

MACH= 0.600  
ROLL= 45.00  
ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSS00C	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1640	-0.1477	-0.1375	0.0163	-0.1538
138.00	-0.1570	-0.1341	-0.1284	0.0229	-0.1513
140.00	-0.1416	-0.1228	-0.1136	0.0188	-0.1325
142.00	-0.1251	-0.1127	-0.1151	0.0125	-0.1276
144.00	-0.1077	-0.1101	-0.1118	-0.0024	-0.1094
146.00	-0.0998	-0.0995	-0.1028	0.0004	-0.1032
148.00	-0.1011	-0.0879	-0.0960	0.0132	-0.1092
150.00	-0.0949	-0.0805	-0.0840	0.0145	-0.0985
152.00	-0.0817	-0.0672	-0.0726	0.0146	-0.0872

ORIGINAL PAGE IS  
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TABLE D-110

MACH= 0.800  
 ROLL= 45.00  
 ALPP= 145.6

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSS00C	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1500	-0.1577	-0.1627	-0.0077	-0.1550
138.00	-0.1488	-0.1528	-0.1527	-0.0039	-0.1487
140.00	-0.1432	-0.1405	-0.1380	0.0027	-0.1407
142.00	-0.1373	-0.1258	-0.1238	0.0114	-0.1353
144.00	-0.1300	-0.1158	-0.1123	0.0142	-0.1265
146.00	-0.1230	-0.1022	-0.1067	0.0200	-0.1275
148.00	-0.1104	-0.0959	-0.0968	0.0145	-0.1113
150.00	-0.1001	-0.0873	-0.0897	0.0128	-0.1025
152.00	-0.0884	-0.0791	-0.0841	0.0093	-0.0934

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.900  
 ROLL= 45.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSS00C	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1742	-0.1643	-0.1863	0.0099	-0.1962
138.00	-0.1673	-0.1600	-0.1763	0.0073	-0.1837
140.00	-0.1568	-0.1548	-0.1667	0.0020	-0.1687
142.00	-0.1446	-0.1346	-0.1590	0.0100	-0.1690
144.00	-0.1375	-0.1254	-0.1474	0.0121	-0.1595
146.00	-0.1305	-0.1178	-0.1367	0.0127	-0.1494
148.00	-0.1175	-0.1051	-0.1276	0.0124	-0.1400
150.00	-0.1072	-0.0963	-0.1180	0.0109	-0.1289
152.00	-0.0961	-0.0829	-0.1053	0.0132	-0.1185

ORIGINAL PAGE IS  
OF POOR QUALITY

TUT 660 SRB STING INTERFERENCE STUDY-INTERPOLATED DATA NOV 81

TABLE D-111

MACH= 1.050  
ROLL= 45.00  
ALPP= 145.0

CR MARSHALL STING 'C' RANGE

ALPHA	CR MSS00C	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1746	-0.1731	-0.1791	0.0015	-0.1806
138.00	-0.1670	-0.1637	-0.1714	0.0033	-0.1747
140.00	-0.1552	-0.1504	-0.1627	0.0048	-0.1675
142.00	-0.1401	-0.1360	-0.1419	0.0041	-0.1450
144.00	-0.1321	-0.1294	-0.1224	0.0027	-0.1251
146.00	-0.1235	-0.1224	-0.1125	0.0011	-0.1136
148.00	-0.1255	-0.1186	-0.1056	0.0068	-0.1124
150.00	-0.1187	-0.1022	-0.0993	0.0165	-0.1158
152.00	-0.1052	-0.0891	-0.0901	0.0171	-0.1072

MACH= 1.100  
ROLL= 45.00  
ALPP= 145.0

CR MARSHALL STING 'C' RANGE

ALPHA	CR MSS00C	CR MSSNDC	R MOONSC	DEL CR MM	CR MM
136.00	-0.1778	-0.1601	-0.1761	0.0177	-0.1938
138.00	-0.1702	-0.1509	-0.1689	0.0193	-0.1883
140.00	-0.1644	-0.1410	-0.1589	0.0234	-0.1823
142.00	-0.1550	-0.1315	-0.1526	0.0235	-0.1761
144.00	-0.1505	-0.1245	-0.1456	0.0260	-0.1716
146.00	-0.1481	-0.1191	-0.1361	0.0290	-0.1651
148.00	-0.1381	-0.1074	-0.1255	0.0307	-0.1562
150.00	-0.1320	-0.1051	-0.1133	0.0269	-0.1402
152.00	-0.1182	-0.0826	-0.1002	0.0356	-0.1358

TABLE D-112

MACH= 1.200  
 ROLL= 45.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MS00C	CR MSNDIC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1507	-0.1648	-0.1617	-0.0142	-0.1475
138.00	-0.1437	-0.1529	-0.1503	-0.0091	-0.1412
140.00	-0.1372	-0.1401	-0.1399	-0.0029	-0.1370
142.00	-0.1283	-0.1287	-0.1313	-0.0004	-0.1309
144.00	-0.1242	-0.1262	-0.1249	-0.0021	-0.1228
146.00	-0.1230	-0.1264	-0.1220	-0.0034	-0.1186
148.00	-0.1149	-0.1194	-0.1169	-0.0045	-0.1124
150.00	-0.1087	-0.0977	-0.1046	0.0110	-0.1156
152.00	-0.0960	-0.0967	-0.0926	0.0013	-0.0939

ORIGINAL PAGE IS  
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MACH= 1.460  
 ROLL= 45.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MS00C	CR MSNDIC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.1406	-0.1558	-0.1522	-0.0152	-0.1380
138.00	-0.1314	-0.1468	-0.1433	-0.0154	-0.1279
140.00	-0.1221	-0.1391	-0.1329	-0.0170	-0.1159
142.00	-0.1124	-0.1316	-0.1264	-0.0191	-0.1073
144.00	-0.1032	-0.1229	-0.1201	-0.0197	-0.1003
146.00	-0.0951	-0.1145	-0.1140	-0.0194	-0.0945
148.00	-0.0864	-0.1040	-0.1102	-0.0177	-0.0925
150.00	-0.0804	-0.0943	-0.1049	-0.0139	-0.0910
152.00	-0.0756	-0.0865	-0.0961	-0.0109	-0.0852

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TJUT 660 SRB STING INTERFERENCE STUDY-INTERPOLATED DATA

TABLE D-113

CR MARSHALL STING 'C' RANGE

MACH= 0.600  
ROLL= 90.00  
ALPP= 145.0

ALPHA	CR MSS00C	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.0214	-0.0326	-0.0133	-0.0111	-0.0021
138.00	-0.0197	-0.0261	-0.0142	-0.0063	-0.0079
140.00	-0.0135	-0.0209	-0.0000	-0.0074	0.0066
142.00	-0.0134	-0.0168	-0.0036	-0.0034	-0.0002
144.00	-0.0094	-0.0130	-0.0142	-0.0036	-0.0105
146.00	-0.0069	-0.0096	-0.0141	-0.0027	-0.0115
148.00	-0.0038	-0.0130	-0.0121	-0.0091	-0.0030
150.00	-0.0034	-0.0127	-0.0046	-0.0093	0.0047
152.00	-0.0041	-0.0050	-0.0025	-0.0009	-0.0016

ORIGINAL PAGE IS  
OF POOR QUALITY

CR MARSHALL STING 'C' RANGE

MACH= 0.800  
ROLL= 90.00  
ALPP= 145.0

ALPHA	CR MSS00C	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.0310	-0.0381	-0.0143	-0.0071	-0.0072
138.00	-0.0181	-0.0202	-0.0110	-0.0022	-0.0008
140.00	-0.0154	-0.0219	-0.0087	-0.0064	-0.0023
142.00	-0.0077	-0.0172	-0.0101	-0.0095	-0.0006
144.00	-0.0073	-0.0151	-0.0081	-0.0078	-0.0003
146.00	-0.0068	-0.0161	-0.0061	-0.0093	0.0032
148.00	-0.0084	-0.0195	-0.0023	-0.0111	0.0088
150.00	-0.0013	-0.0157	-0.0010	-0.0144	0.0134
152.00	0.0032	-0.0074	-0.0054	-0.0106	0.0052



TABLE D-1114

MACH= 0.900  
 ROLL= 90.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSSOOC	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.0461	-0.0594	-0.0168	-0.0133	-0.0035
138.00	-0.0303	-0.0459	-0.0128	-0.0156	0.0027
140.00	-0.0221	-0.0372	-0.0157	-0.0150	-0.0007
142.00	-0.0132	-0.0325	-0.0219	-0.0194	-0.0026
144.00	-0.0164	-0.0271	-0.0200	-0.0107	-0.0093
146.00	-0.0170	-0.0223	-0.0167	-0.0053	-0.0114
148.00	-0.0150	-0.0224	-0.0179	-0.0074	-0.0105
150.00	-0.0077	-0.0199	-0.0151	-0.0122	-0.0029
152.00	-0.0049	-0.0196	-0.0076	0.0147	0.0072

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.050  
 ROLL= 90.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSSOOC	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.0292	-0.0300	-0.0144	-0.0008	-0.0135
138.00	-0.0327	-0.0351	-0.0152	-0.0025	-0.0127
140.00	-0.0344	-0.0385	-0.0145	-0.0040	-0.0104
142.00	-0.0309	-0.0368	-0.0144	-0.0059	-0.0085
144.00	-0.0227	-0.0337	-0.0148	-0.0110	-0.0038
146.00	-0.0112	-0.0256	-0.0143	-0.0144	0.0001
148.00	-0.0041	-0.0182	-0.0137	-0.0141	0.0004
150.00	0.0008	-0.0175	-0.0126	-0.0183	0.0057
152.00	-0.0065	-0.0145	-0.0058	-0.0080	0.0022

TABLE D-115

MACH= 1.100  
 ROLL= 90.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSSOOC	CR MSSNDC	CR MOOHSC	DEL CR MMH	CR MMH
136.00	-0.0130	-0.0117	-0.0231	0.0013	-0.0244
138.00	-0.0151	-0.0133	-0.0211	0.0017	-0.0228
140.00	-0.0188	-0.0155	-0.0156	0.0033	-0.0189
142.00	-0.0200	-0.0222	-0.0127	-0.0022	-0.0105
144.00	-0.0209	-0.0244	-0.0136	-0.0034	-0.0102
146.00	-0.0191	-0.0230	-0.0146	-0.0039	-0.0107
148.00	-0.0139	-0.0235	-0.0142	-0.0096	-0.0046
150.00	-0.0096	-0.0227	-0.0130	-0.0132	0.0001
152.00	-0.0071	-0.0093	-0.0110	-0.0022	-0.0088

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.200  
 ROLL= 90.00  
 ALPP= 145.0

## CR MARSHALL STING 'C' RANGE

ALPHA	CR MSSOOC	CR MSSNDC	CR MOOHSC	DEL CR MMH	CR MMH
136.00	-0.0294	-0.0146	-0.0190	0.0148	-0.0346
138.00	-0.0272	-0.0149	-0.0181	0.0123	-0.0304
140.00	-0.0264	-0.0164	-0.0193	0.0100	-0.0292
142.00	-0.0224	-0.0170	-0.0148	0.0054	-0.0202
144.00	-0.0245	-0.0176	-0.0115	0.0069	-0.0184
146.00	-0.0264	-0.0152	-0.0094	0.0111	-0.0206
148.00	-0.0312	-0.0181	-0.0092	0.0121	-0.0224
150.00	-0.0293	-0.0179	-0.0117	0.0114	-0.0231
152.00	-0.0217	-0.0142	-0.0128	0.0075	-0.0204

TABLE D-116

MACH= 1.460  
ROLL= 90.00  
ALPP= 145.0

CR MARSHALL STING 'C' RANGE

ALPHA	CR MSSOOC	CR MSSNDC	CR MOONSC	DEL CR MM	CR MM
136.00	-0.0454	-0.0550	-0.0223	-0.0096	-0.0128
138.00	-0.0402	-0.0556	-0.0246	-0.0154	-0.0092
140.00	-0.0379	-0.0513	0.0237	-0.0139	-0.0098
142.00	-0.0346	-0.0467	-0.0233	-0.0121	-0.0112
144.00	-0.0339	-0.0483	-0.0214	-0.0144	-0.0070
146.00	-0.0355	-0.0468	-0.0190	-0.0113	-0.0077
148.00	-0.0393	-0.0478	-0.0192	-0.0085	-0.0106
150.00	-0.0418	-0.0510	-0.0207	-0.0092	-0.0115
152.00	-0.0392	-0.0454	-0.0223	-0.0062	-0.0161

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 0.630  
ROLL= 0.00  
ALPP= 145.0

CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSSOOC	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.3760	-2.3243	-2.3414	0.0517	-2.3931
138.00	-2.4274	-2.3908	-2.3844	0.0366	-2.4210
140.00	-2.4458	-2.4549	-2.4410	-0.0091	-2.4319
142.00	-2.4580	-2.5027	-2.4996	-0.0447	-2.4548
144.00	-2.5659	-2.5578	-2.5424	0.0081	-2.5505
146.00	-2.6541	-2.6274	-2.6015	0.0266	-2.6281
148.00	-2.6914	-2.6576	2.6240	0.0330	-2.6586
150.00	-2.7074	-2.6688	-2.6373	0.0385	-2.6758
152.00	-2.7104	-2.6705	-2.6342	0.0399	-2.6741

ORIGINAL PAGE IS  
OF POOR QUALITY

TABLE D-117

MACH= 0.800  
ROLL= 0.00  
ALPP= 145.0

CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSND	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.5614	-2.5907	-2.5126	-0.0293	-2.4833
138.00	-2.6284	-2.6583	-2.5894	-0.0299	-2.5595
140.00	-2.6923	-2.7209	-2.6632	-0.0286	-2.6346
142.00	-2.7542	-2.7862	-2.7277	-0.0320	-2.6957
144.00	-2.8312	-2.8644	-2.7941	-0.0332	-2.7609
146.00	-2.8898	-2.9204	-2.8569	-0.0306	-2.8264
148.00	-2.9109	-2.9412	-2.8758	-0.0304	-2.8455
150.00	-2.9223	-2.9427	-2.8804	-0.0203	-2.8601
152.00	-2.9239	-2.9356	-2.8832	-0.0116	-2.8715

CAT MARSHALL STING 'C' RANGE

MACH= 0.900  
ROLL= 0.00  
ALPP= 145.0

ALPHA	CAT MSS00C	CAT MSSND	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.7440	-2.7469	-2.6617	-0.0029	-2.6588
138.00	-2.8192	-2.8167	-2.7457	0.0025	-2.7482
140.00	-2.8849	-2.8858	-2.8171	-0.0009	-2.8162
142.00	-2.9577	-2.9529	-2.8871	0.0048	-2.8920
144.00	-3.0245	-3.0301	-2.9662	-0.0057	-2.9605
146.00	-3.0926	-3.0992	-3.0399	-0.0060	-3.0333
148.00	-3.1322	-3.1243	-3.0797	0.0079	-3.0876
150.00	-3.1485	-3.1300	-3.0997	0.0186	-3.1182
152.00	-3.1566	-3.1305	-3.1150	0.0261	-3.1411

TABLE D-118

MACH= 1.050  
ROLL= 0.00  
ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.9043	-2.9500	-2.8999	-0.0450	-2.8542
138.00	-2.9935	-3.0306	-2.9933	-0.0371	-2.9562
140.00	-3.0798	-3.1057	-3.0859	-0.0259	-3.0600
142.00	-3.1747	-3.1873	-3.1775	-0.0126	-3.1648
144.00	-3.2922	-3.2859	-3.2878	0.0063	-3.2941
146.00	-3.3837	-3.3582	-3.3851	0.0255	-3.4106
148.00	-3.4490	-3.4043	-3.4484	0.0447	-3.4931
150.00	-3.4852	-3.4371	-3.5021	0.0481	-3.5502
152.00	-3.5357	-3.4778	-3.5507	0.0579	-3.6086

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 1.100  
ROLL= 0.00  
ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.9781	-3.0284	-2.9954	-0.0503	-2.9451
138.00	-3.0718	-3.1219	-3.1031	-0.0501	-3.0530
140.00	-3.1594	-3.2125	-3.2093	-0.0531	-3.1562
142.00	-3.2514	-3.2937	-3.3121	-0.0423	-3.2698
144.00	-3.3490	-3.3757	-3.3973	-0.0267	-3.3706
146.00	-3.4330	-3.4481	-3.4742	-0.0151	-3.4591
148.00	-3.4927	-3.4867	-3.5306	0.0060	-3.5366
150.00	-3.5277	-3.5219	-3.5537	0.0058	-3.5596
152.00	-3.5442	-3.5412	-3.5700	0.0030	-3.5730

TABLE D-119

MACH= 1.200  
 ROLL= 0.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-3.0388	-3.0532	-3.0991	-0.0144	-3.0847
138.00	-3.1389	-3.1637	-3.2108	-0.0248	-3.1860
140.00	-3.2396	-3.2668	-3.3160	-0.0272	-3.2889
142.00	-3.3446	-3.3623	-3.4161	-0.0177	-3.3984
144.00	-3.4489	-3.4483	-3.5095	0.0006	-3.5101
146.00	-3.5379	-3.5227	-3.5863	0.0152	-3.6015
148.00	-3.6232	-3.5830	-3.6456	0.0394	-3.6850
150.00	-3.6652	-3.6271	-3.6883	0.0381	-3.7264
152.00	-3.6793	-3.6382	-3.7038	0.0411	-3.7449

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.460  
 ROLL= 0.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-3.0498	-3.0919	-3.0897	-0.0421	-3.0476
138.00	-3.1489	-3.1800	-3.2085	-0.0311	-3.1774
140.00	-3.2412	-3.2659	-3.2995	-0.0247	-3.2748
142.00	-3.3169	-3.3373	-3.3734	-0.0204	-3.3531
144.00	-3.3949	-3.4018	-3.4363	-0.0068	-3.4295
146.00	-3.4704	-3.4686	-3.4989	0.0019	-3.5007
148.00	-3.5412	-3.5306	-3.5659	0.0105	-3.5765
150.00	-3.6221	-3.5929	-3.6384	0.0292	-3.6676
152.00	-3.6471	-3.6167	-3.6962	0.0303	-3.7266

TABLE D-120

MACH= 0.600  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MS00C	CAT MSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.3260	-2.3418	-2.3221	-0.0157	-2.3064
138.00	-2.3987	-2.4129	-2.3938	-0.0142	-2.3796
140.00	-2.4777	-2.4913	-2.4635	-0.0136	-2.4499
142.00	-2.5646	-2.5716	-2.5474	-0.0069	-2.5405
144.00	-2.6305	-2.6395	-2.6073	-0.0090	-2.5983
146.00	-2.6754	-2.6884	-2.6621	-0.0131	-2.6491
148.00	-2.7058	-2.7233	-2.6949	-0.0164	-2.6785
150.00	-2.7232	-2.7429	-2.7198	-0.0197	-2.7001
152.00	-2.7361	-2.7391	-2.7050	-0.0030	-2.7020

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.800  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MS00C	CAT MSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.4267	-2.4569	-2.4576	-0.0302	-2.4274
138.00	-2.5601	-2.5290	-2.5207	0.0311	-2.5518
140.00	-2.6456	-2.6159	-2.5836	0.0227	-2.6133
142.00	-2.7577	-2.7279	-2.6583	0.0298	-2.6881
144.00	-2.8467	-2.8043	-2.7431	0.0423	-2.7855
146.00	-2.9107	-2.8659	-2.8227	0.0448	-2.8675
148.00	-2.9521	-2.9120	-2.8725	0.0401	-2.9126
150.00	-2.9643	-2.9316	-2.9027	0.0327	-2.9354
152.00	-2.9640	-2.9302	-2.9079	0.0337	-2.9416

TABLE D-121

MACH= 0.900  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.6513	-2.6563	-2.6159	-0.0050	-2.6110
138.00	-2.7127	-2.7349	-2.7164	-0.0223	-2.6942
140.00	-2.8119	-2.8063	-2.8013	0.0056	-2.8069
142.00	-2.8925	-2.8859	-2.8705	0.0066	-2.8771
144.00	-2.9704	-2.9604	-2.9548	0.0100	-2.9648
146.00	-3.0540	-3.0351	-3.0290	0.0189	-3.0480
148.00	-3.1139	-3.0859	-3.0929	0.0280	-3.1208
150.00	-3.1464	-3.1171	-3.1338	0.0294	-3.1632
152.00	-3.1639	-3.1241	-3.1377	0.0397	-3.1774

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.050  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.8991	-2.3260	-2.8879	-0.0260	-2.8610
138.00	-3.0050	-3.0176	-2.9583	-0.0125	-2.9857
140.00	-3.1203	-3.1116	-3.1021	0.0087	-3.1108
142.00	-3.2251	-3.1946	-3.1876	0.0305	-3.2181
144.00	-3.3167	-3.2735	-3.2891	0.0431	-3.3322
146.00	-3.3765	-3.3299	-3.3832	0.0465	-3.4297
148.00	-3.4179	-3.3604	-3.4347	0.0574	-3.4921
150.00	-3.5032	-3.4228	-3.4886	0.0604	-3.5690
152.00	-3.5629	-3.4810	-3.5391	0.0819	-3.6210



TABLE D-122

LH= 1.100  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-3.0130	-3.0250	-3.0200	-0.0121	-3.0079
138.00	-3.1032	-3.1138	-3.1283	-0.0107	-3.1176
140.00	-3.2018	-3.2042	-3.2392	0.0024	-3.2368
142.00	-3.3101	-3.2949	-3.3438	0.0152	-3.3589
144.00	-3.3974	-3.3798	-3.4373	0.0176	-3.4549
146.00	-3.4480	-3.4246	-3.4792	0.0235	-3.5027
148.00	-3.4891	-3.4659	-3.4770	0.0232	-3.5002
150.00	-3.5229	-3.4818	-3.4920	0.0411	-3.5332
152.00	-3.5436	-3.5217	-3.5371	0.0219	-3.5590

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.200  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-3.0992	-3.0898	-3.1483	0.0094	-3.1577
138.00	-3.1984	-3.1863	-3.2515	0.0120	-3.2636
140.00	-3.3019	-3.2800	-3.3526	0.0219	-3.3745
142.00	-3.3980	-3.3747	-3.4573	0.0233	-3.4806
144.00	-3.4843	-3.4589	-3.5485	0.0254	-3.5739
146.00	-3.5543	-3.5159	-3.6092	0.0384	-3.6476
148.00	-3.6207	-3.5622	-3.6502	0.0585	-3.7087
150.00	-3.6707	-3.5925	-3.6789	0.0782	-3.7570
152.00	-3.7014	-3.6166	-3.6905	0.0847	-3.7753

TABLE D-123

MACH= 1.450  
 ROLL= 45.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-3.0483	-3.0786	-3.0948	-0.0304	-3.0645
138.00	-3.1526	-3.1779	-3.2141	-0.0253	-3.1888
140.00	-3.2428	-3.2677	-3.3047	-0.0249	-3.2798
142.00	-3.3229	-3.3384	-3.3793	-0.0155	-3.3638
144.00	-3.3909	-3.3991	-3.4410	-0.0082	-3.4327
146.00	-3.4605	-3.4630	-3.5019	-0.0025	-3.4994
148.00	-3.5331	-3.5166	-3.5638	0.0164	-3.5803
150.00	-3.6033	-3.5679	-3.6160	0.0355	-3.6515
152.00	-3.6679	-3.6863	-3.6586	0.0616	-3.7202

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.600  
 ROLL= 90.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.3417	-2.3565	-2.3394	-0.0148	-2.3246
138.00	-2.3997	-2.4112	-2.3860	-0.0115	-2.3745
140.00	-2.4526	-2.4711	-2.4368	-0.0185	-2.4183
142.00	-2.5170	-2.5300	-2.4954	-0.0130	-2.4823
144.00	-2.5781	-2.5827	-2.5532	-0.0046	-2.5487
146.00	-2.6465	-2.6473	-2.6171	-0.0008	-2.6163
148.00	-2.7098	-2.7050	-2.6722	0.0048	-2.6770
150.00	-2.7513	-2.7415	-2.7114	0.0097	-2.7212
152.00	-2.7620	-2.7547	-2.7192	0.0073	-2.7264

TABLE D-124

MACH= 0.800  
 ROLL= 90.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.5390	-2.5089	-2.4987	0.0301	-2.5288
138.00	-2.5916	-2.5724	-2.5494	0.0192	-2.5696
140.00	-2.6413	-2.6277	-2.6032	0.0136	-2.6167
142.00	-2.6964	-2.6906	-2.6617	0.0059	-2.6675
144.00	-2.7728	-2.7671	-2.7332	0.0057	-2.7389
146.00	-2.8585	-2.8424	-2.8141	0.0160	-2.8302
148.00	-2.9196	-2.9050	-2.8760	0.0135	-2.8895
150.00	-2.9574	-2.9461	-2.9100	0.0113	-2.9213
152.00	-2.9841	-2.9654	-2.9420	0.0167	-2.9607

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 0.900  
 ROLL= 90.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.6969	-2.6993	-2.6402	-0.0024	-2.6378
138.00	-2.7724	-2.7639	-2.7321	0.0085	-2.7406
140.00	-2.0464	-2.8509	-2.8086	-0.0045	-2.8040
142.00	-2.9055	-2.9234	-2.8879	-0.0179	-2.8700
144.00	-2.9877	-2.9836	-2.9711	0.0040	-2.9751
146.00	-3.0659	-3.0628	-3.0392	0.0032	-3.0424
148.00	-3.1144	-3.1170	-3.1003	-0.0026	-3.0977
150.00	-3.1522	-3.1474	-3.1430	0.0047	-3.1478
152.00	-3.1887	-3.1713	-3.1722	0.0174	-3.1896

TABLE D-125

MACH= 1.050  
 ROLL= 90.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSSOOC	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-2.9189	-2.9324	-2.8882	-0.0135	-2.8746
138.00	-3.0154	-3.0141	-2.9936	0.0012	-2.9948
140.00	-3.1158	-3.1081	-3.0971	0.0077	-3.1048
142.00	-3.2200	-3.2112	-3.2032	0.0088	-3.2120
144.00	-3.3206	-3.2997	-3.3281	0.0209	-3.3490
146.00	-3.4195	-3.3747	-3.4368	0.0448	-3.4816
148.00	-3.5001	-3.4356	-3.4940	0.0645	-3.5585
150.00	-3.5406	-3.4654	-3.5391	0.0752	-3.6144
152.00	-3.5716	-3.4884	-3.5761	0.0832	-3.6593

ORIGINAL PAGE IS  
 OF POOR QUALITY

MACH= 1.100  
 ROLL= 90.00  
 ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSSOOC	CAT MSSNDC	CAT MOONSC	DEL CAT MM	CAT MM
136.00	-3.0018	-3.0338	-3.0264	-0.0319	-2.9945
138.00	-3.1030	-3.1243	-3.1240	-0.0213	-3.1027
140.00	-3.2010	-3.2109	-3.2284	-0.0099	-3.2185
142.00	-3.2957	-3.2981	-3.3295	-0.0024	-3.3271
144.00	-3.3876	-3.3786	-3.4182	0.0089	-3.4271
146.00	-3.4747	-3.4441	-3.4879	0.0306	-3.5080
148.00	-3.5335	-3.4989	-3.5363	0.0345	-3.5984
150.00	-3.5692	-3.5374	-3.5635	0.0349	-3.6120
152.00	-3.5798	-3.5483	-3.5805	0.0315	-3.6120

TABLE D-126

MACH= 1.200  
ROLL= 90.00  
ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MODISC	DEL CAT MM	CAT MM
136.00	-3.0927	-3.0965	-3.1337	-0.0038	-3.1299
138.00	-3.1863	-3.1893	-3.2363	-0.0029	-3.2334
140.00	-3.2821	-3.2835	-3.3280	-0.0014	-3.3266
142.00	-3.3848	-3.3785	-3.4279	0.0064	-3.4342
144.00	-3.4888	-3.4674	-3.5182	0.0214	-3.5396
146.00	-3.5670	-3.5377	-3.5965	0.0293	-3.6259
148.00	-3.6441	-3.5984	-3.6649	0.0457	-3.7105
150.00	-3.6865	-3.6355	-3.7106	0.0510	-3.7616
152.00	-3.7086	-3.6468	-3.7283	0.0618	-3.7901

ORIGINAL PAGE IS  
OF POOR QUALITY

MACH= 1.460  
ROLL= 90.00  
ALPP= 145.0

## CAT MARSHALL STING 'C' RANGE

ALPHA	CAT MSS00C	CAT MSSNDC	CAT MODISC	DEL CAT MM	CAT MM
136.00	-3.0519	-3.0926	-3.0985	-0.0407	-3.0578
138.00	-3.1534	-3.1890	-3.2105	-0.0355	-3.1750
140.00	-3.2445	-3.2733	-3.2953	-0.0288	-3.2665
142.00	-3.3272	-3.3529	-3.3699	-0.0257	-3.3441
144.00	-3.3947	-3.4182	-3.4348	-0.0235	-3.4114
146.00	-3.4706	-3.4846	-3.4975	-0.0140	-3.4835
148.00	-3.5398	-3.5433	-3.5623	-0.0035	-3.5588
150.00	-3.6108	-3.6050	-3.6257	0.0057	-3.6315
152.00	-3.6689	-3.6483	-3.6812	0.0265	-3.7017